NEW JERSEY DEPARTMENT OF TRANSPORTATION COMPLETE STREETS IMPLEMENTATION GUIDE

COMPREHENSIVE SOLUTIONS HANDBOOK

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1 PURPOSE

New Jersey Department of Transportation Complete Streets Policy Background

The New Jersey Department of Transportation (NJDOT) believes that streets should accommodate safe travel for all users, including the most vulnerable users of the transportation network. A Complete Street (CS) provides safe access for all users through the design and operation of a comprehensive, integrated, connected multi-modal network of transportation options. Consideration of accommodations for all users during the development and delivery of projects on public roadways are supported by the 2024 NJDOT Complete Streets Policy (CS Policy), Policy No. 703.

The CS Policy documents the requirement that future roadway improvement projects include safe and equitable accommodations for all users, including bicyclists, pedestrians, transit riders, freight delivery personnel, and individuals with disabilities, as well as provisions for utilizing Context Sensitive Design[1]. The CS Policy also discusses relevant constraints, lists exempt project types, and identifies resources for implementation, noting the need for a comprehensive approach to consider all levels of potential accommodations and safety improvements.

[1] As per FHWA, "Context Sensitive Design asks questions first about the need and purpose of the transportation project, and then equally addresses safety, mobility, and the preservation of scenic, aesthetic, historic, environmental, and other community values."

The NJDOT Complete Streets Implementation Guide - Comprehensive Solutions Handbook (CS Handbook) presents procedures for implementing Complete Streets across all project types. The CS Handbook informs practitioners of possible constraints, the range of available solutions, and guidance on how to best implement the CS Policy. This guidance includes Complete Streets Comprehensive Solutions, Complete Streets Checklists specific to applicable project delivery phases, descriptions of potential and appropriate improvements, and other resources to assist in implementation of the Department's CS Policy.

NJDOT Complete Streets Checklists

Practitioners involved in different phases of the project delivery process may utilize the phase-specific checklists to identify Complete Streets requirements. The checklists' purpose and applicability are provided below:

The Complete Streets Checklists apply to all NJDOT projects funded or administered under the NJDOT Capital Program, that undergo the Capital Project Delivery (CPD) process. These checklists are for use on projects during the Concept Development (CD) (Full Scope and Limited Scope projects), Preliminary Engineering (PE) (Full Scope projects), and Final Design (FD) (Limited Scope projects) phases to ensure Complete Streets accommodations are included in the project budget. The project manager or job manager is responsible for completing the appropriate checklist and must engage the Bureau of Safety, Bicycle & Pedestrian Programs (BSBPP) via scope team and core group meetings to discuss bicycle and pedestrian accommodations and resolve issues prior to advancement of a project through the CPD process, beginning with CD.

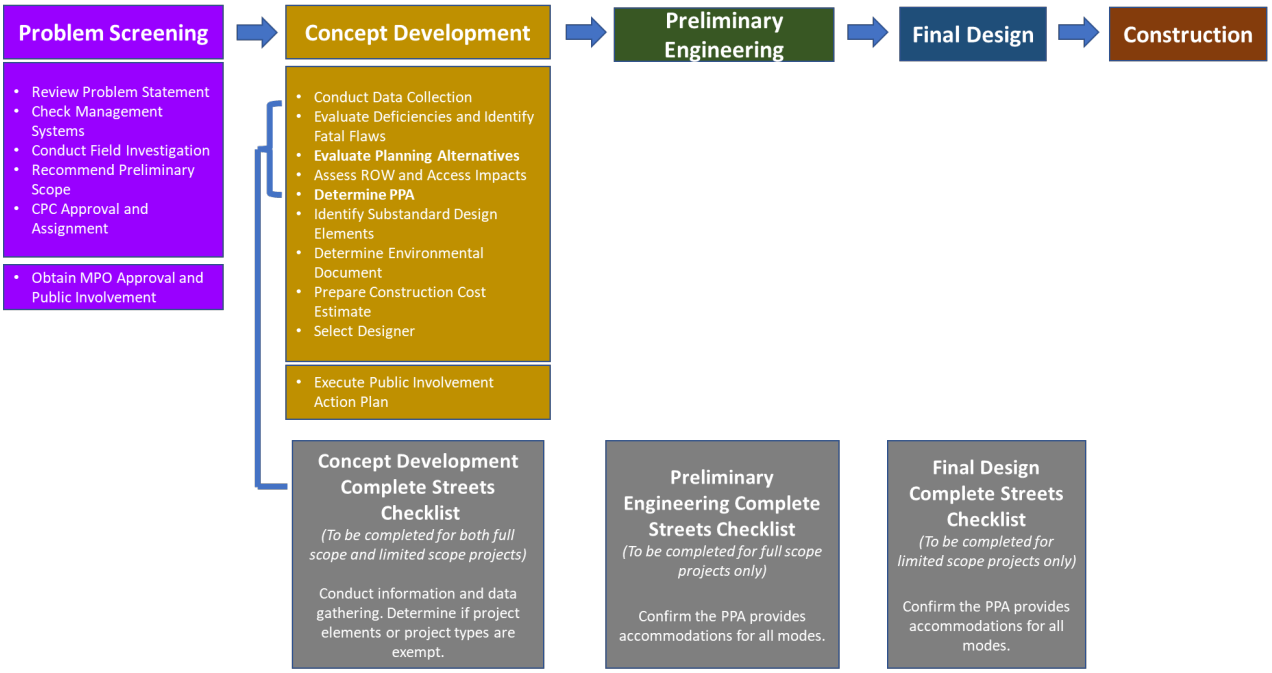
2 NJDOT PROJECT DELIVERY PROCESSES

The Department follows a project delivery process, which has five phases. Dependent on the type of project, all five phases are not always followed. To account for this, the CS Policy integrates phase-specific Complete Streets checklists. This section of the handbook provides summaries of these procedures.

Full Scope Project Delivery Approach

NJDOT Full Scope capital projects follow a standardized project delivery process that aligns with Federal Highway Administration (FHWA) regulations. The process consists of five phases: Problem Screening, CD, PE, FD, and Construction. The NJDOT Complete Streets policy dictates that consideration of Complete Streets solutions should begin at the earliest stages of the CD phase, so that any multimodal improvements are included in the project scope and Preliminary Preferred Alternative (PPA). Project managers for Full Scope projects are required to complete a CD (Full Scope) Complete Streets Checklist and a PE (Full Scope) Complete Streets Checklist as part of this process.

FIGURE 2-1 NJDOT CAPITAL DELIVERY PROCESS



Source: NJDOT Project Delivery Process Overview.

Limited Scope Project Delivery Approach

NJDOT Limited Scope Project Delivery is intended to address deficiencies to extend the functional and structural life of the Department's assets. The main difference between Limited Scope and Full Scope process is that Limited Scope does not have a formal PE phase. Similar to Full Scope projects, Limited Scope projects must consider Complete Streets solutions at the earliest stages of CD. Project managers of Limited Scope projects are required to fill out a CD (Limited Scope) Complete Streets Checklist and FD (Limited Scope) Complete Streets Checklist as part of this process. It is acknowledged that for some of the Limited Scope projects, namely "Checklist Only Limited Scope Projects", Complete Streets checklist items may not be applicable. Complete Streets considerations will not supersede any stated requirements for limited scope projects and processes approved by FHWA, including sign structure installation, concrete pavement repair, rockfall mitigation, culvert lining and outfalls, bridge substructures, scour mitigation, guiderail replacement, and horizontal curve signage.

Simple Fix

For “simple fix” projects undertaken by Operations and the Division of Traffic Engineering (DTE), low-effort solutions such as painting, signal timing revisions, and signage (defined in Section 3 as Type C solutions) must be considered during the project delivery process.

3 COMPREHENSIVE SOLUTIONS APPROACH KEY DEFINITIONS

Comprehensive Solution Definitions

The Comprehensive Solutions Approach follows a standardized process that ensures thorough consideration of Complete Streets solutions at the earliest stages of the project delivery process. It considers a wide range of design solutions for all user types: bicyclists, pedestrians, transit users, freight delivery personnel, and individuals with disabilities. There are three categories of Complete Streets accommodations within the Comprehensive Solutions Approach.

- **Type A** solutions are high-effort solutions that typically involve new or significant reconstruction and can include right-of-way (ROW) acquisition, environmental permitting, and utility work. Examples include sidewalks, curb extensions, median refuge islands, protected bicycle lanes, multi-use paths, and curb cuts. Type A Solutions are typically suited for Full Scope projects and for roadways where ROW is available. However, these solutions can be applicable to Limited Scope projects in cases where constraints are limited.

- **Type B** solutions are medium-effort solutions that maintain the existing footprint of the roadway and typically involve minor utility work and no right-of-way acquisition or accelerated right-of-way acquisition. Examples include pedestrian-scale lighting, dedicated pedestrian signal phases, pedestrian detection, lead pedestrian intervals, bicycle lanes, and improved shoulders. Type B Solutions are typically suited for Limited Scope projects with CD Reports but may also involve Full Scope projects.

- **Type C** solutions are primarily limited to striping, pavement markings, and signage and have minimal effect on project schedule or cost. Examples include striped crosswalks, high-visibility crosswalks, sharrows, pedestrian signage and wayfinding, and painted conflict areas. Type C Solutions are suited for simple fix type projects, such as preventative maintenance, pavement preservation, Limited Scope CD checklist-only projects, Limited Scope projects with CD Reports, and Full Scope projects.

Exemption and Constraints Criteria

The project manager or job manager is responsible for providing justification for exemptions and constraint criteria determinations. These determinations and justifications must be based on the criteria listed under the Major and Moderate Constraints below and are utilized to determine the feasibility of including Type A, Type B, or Type C solutions.

Exemption:

Exemption means the project will not be implementing Complete Streets solutions.

Projects **may** be fully exempt from Complete Streets consideration **only** under the following circumstances:

- Non-motorized users are prohibited on the roadway.
  - This does not include certain facilities, such as ramps or ramp terminals, where non-motorized users may have crossing access or exposure to motorized traffic.
- The project type addresses improvements beyond the roadway where the potential for pedestrian and bicycle travel does not exist and where future pedestrian or bicycle facilities will not be affected.
  - This includes projects such as sign structure installation, concrete pavement repair, rockfall mitigation, culvert lining and outfalls, bridge substructures, scour mitigation, guiderail replacement, and horizontal curve signage.

Major Constraints (applicable for Type A solutions):

A specific Type A Solution **may** be considered for omission if it is subject to any of the following major constraints:

- Scarcity of population, travel, and attractors, both existing and future, indicates an absence of need for such design measures and is supported by applicable data for applicable peak periods.

  For example, for the Bridge Replacement Project for Northbound and Southbound Bridges over Crosswicks Creek on Route 206, the initial proposal was to provide two 12-foot lanes, with a 10-foot outside shoulder to accommodate potential bicycle traffic and a 6-foot sidewalk to accommodate potential pedestrians. However, after discussion with the BSBPP team, it was agreed that since there is a scarcity of pedestrians, the project should provide an 8-foot shared use path to accommodate both pedestrians and bicycles. A pedestrian separation barrier will be provided as required.

- Detrimental environmental, right of way, or socio-economic impacts outweigh the need for implementation of Complete Streets solutions.

- The safety of the public or the construction contract award date is determined to be significantly compromised by the inclusion of specific Complete Streets Comprehensive Solutions. An example would be a need for emergency repairs such as bridge repairs and downed traffic signals.

Moderate Constraints (applicable for Type B solutions):

A Type B solution **may** be considered for omission if it is subject to any of the following moderate constraints:

- Detrimental environmental, utility impacts, right of way, or socio-economic impacts outweigh the need for implementation of Complete Streets solutions.

- The safety of the public or the construction contract award date is determined to be significantly compromised by the inclusion of Complete Streets solutions. An example would be the loss of the scheduled construction season for time-sensitive Limited Scope system preservation projects.

Accommodations

Table 3-1 through Table 3-4 below detail various pedestrian, bicycle, transit, and freight accommodations, and are categorized into Type A, Type B, and Type C solutions. While these lists are not exhaustive, they are meant to provide an overview of the types of solutions that should receive consideration.

TABLE 3-1 COMPLETE STREETS ACCOMMODATIONS LIST *PEDESTRIAN SOLUTIONS*

PEDESTRIAN SOLUTION	TYPE A	TYPE B	TYPE C
Sidewalks	●		
Curb extensions	●		
Raised crossings	●		
Median refuge islands	●		
Curb ramps	●		
Pedestrian overpass / underpass	●		
Pedestrian-actuated traffic signals (beacons)	●		
Pedestrian signal heads and pushbuttons		●	
Pedestrian-scale lighting		●	
Pedestrian detection system		●	
Exclusive pedestrian phase		●	
Lead pedestrian interval		●	
Striped crosswalks			●
Signage for roadway crossings and wayfinding			●
High-visibility crosswalks (ladder or zebra)			●

TABLE 3-2 COMPLETE STREETS ACCOMMODATIONS LIST *BICYCLE SOLUTIONS*

BICYCLE SOLUTION	TYPE A	TYPE B	TYPE C
Separated bicycle path / shared use path	●		
Road diet	●		
Bicycle boulevard	●		
Protected bicycle lane	●		
Bicycle lane (space re-allocation)		●	
Wide outside lanes or improved shoulders		●	
Bicycle-actuation at signals (loop detectors and stencil or other means)		●	

BICYCLE SOLUTION	TYPE A	TYPE B	TYPE C
Signs, signals and pavement markings specifically related to bicycle operation on roadways or shared-use facilities			●
Bicycle-safe inlet grates			●

TABLE 3-3 COMPLETE STREETS ACCOMMODATIONS LIST *TRANSIT SOLUTIONS*

TRANSIT SOLUTION	TYPE A	TYPE B	TYPE C
Bus lanes	●		
Bus turnouts	●		
Transit signal priority		●	
Signage			●

TABLE 3-4 COMPLETE STREETS ACCOMMODATIONS LIST *FREIGHT SOLUTIONS*

FREIGHT SOLUTION	TYPE A	TYPE B	TYPE C
Mid-block curb cut	●		
Mountable curb or median	●		
New or widened turn lane	●		
Asymmetrical median nose	●		
Dedicated signal phase		●	
Dedicated curb space / loading zones (signage for new curbside programming)			●
Painted conflict area			●
Recessed stop bars			●

4 COMPREHENSIVE SOLUTIONS PROCESS AND CASE STUDY

Comprehensive Solutions Process

The NJDOT Complete Streets Implementation Guide - Comprehensive Solutions Handbook (CS Handbook) follows a standardized process that ensures thorough consideration of Complete Streets accommodations at the early stages of the Capital Delivery Process.

The project manager or job manager is responsible for ensuring this policy is incorporated into the project development process and the selection of the PPA, and for providing documentation, including justification for all policy exemptions and constraint criteria determinations. Documentation of this decision must be provided to respective Department heads for approval.

Department heads are responsible for ensuring policy compliance. If an agreement cannot be reached on a proposed exemption or constraint criteria determination, the manager and director responsible for the project will elevate the issue(s) to the Assistant Commissioner level.

The approach follows the New Jersey CS Standard Operating Procedure as displayed in Appendix A – Process of Complete Streets Compliance (CD Phase) and Appendix B - Process of Complete Streets Compliance (PE & FD Phases). The process in Appendix A details the process for Complete Streets compliance in the Full Scope and Limited Scope

CD Phases. The process in Appendix B demonstrates the process for Complete Streets compliance in the PE Phase (Full Scope Project) or FD Phase (Limited Scope Project). The project manager should go through the process of Complete Streets compliance for each of the relevant CD, PE, and FD Phases.

To help practitioners understand the process, the following steps outline how a hypothetical Full Scope project, located on a section of roadway with a high number of pedestrian crashes, would utilize the Complete Streets Comprehensive Solutions Approach.

Project Example

This example is for a Full Scope project at an intersection on a public roadway utilized by pedestrians and bicyclists, as well as drivers of all motor vehicle types. The intersection is signalized and has existing pedestrian signals. However, the crossing on the major approaches is across multiple lanes in each direction without the presence of a pedestrian refuge area. This project location has higher-than-average pedestrian crash frequencies. Because this is a Full Scope project, the project manager will follow the process of Complete Streets compliance for the CD Phase and PE Phase.

Procedure

1. **(Appendix A) Review Complete Streets Policy and Determine Exemption.** After the project has been advanced to Concept Development Phase of the capital delivery process, the project manager/designer should complete a review of the Complete Streets Policy at the earliest stages of the CD Phase. The project manager should determine whether the project qualifies for a Complete Streets Exemption (see Section 3). Since non-motorized users are not prohibited on the roadway within the project limits, the project is *not exempt* from Complete Streets action.

2. **Prepare CD Complete Streets Checklist**. The project manager/designer then prepares the Full Scope CD Complete Streets Checklist. While collecting data in the CD phase, the project manager determines that the project location has a higher-than-average number of crashes involving pedestrians. In the Complete Streets checklist, the project manager/designer answers “Yes” to the question “Is there a higher-than-normal incidence of bicyclist/pedestrian crashes within the study area?” While completing the checklist, the project manager/designer solicits input from BSBPP and other Subject Matter Expert (SME) units as applicable.

3. **Submit for BSBPP (SME) Sign-Off.** Once the CD Complete Streets Checklist is complete, the project manager obtains BSBPP's concurrence, and the CD Complete Streets Checklist is signed by the project manager and the reviewing SME. The project manager/designer utilizes the checklist to evaluate Complete Streets solutions.

4. **Consider Solutions.** The project manager/designer starts by considering Type A solutions. After reviewing the Type A solutions list and relevant guidance on context-sensitive solutions (see Section 5), the project manager/designer identifies a pedestrian overpass as an appropriate solution to help reduce pedestrian crashes on the roadway.

5. **Review Major Constraints for Type A solutions**. The project manager /designer reviews the set of major constraints to assess whether any of them would apply to the construction of a pedestrian overpass (see Section 3) and consults BSBPP and department SMEs Core Group[2] for guidance. In this hypothetical example, it is assumed that the socio-economic impacts of installing a pedestrian overpass outweigh the need for the implementation of this Complete Streets solution. Therefore, the project manager would document in writing (with supporting data) that the Type A solution is subject to a major constraint due to socio-economic impacts and is not required to be included in the PPA.

6. **Consider Additional Solutions**. After full consideration of Type A solutions, the project manager/designer considers Type B solutions that would help improve pedestrian safety. After reviewing the Type B solutions list (see Section 5) and relevant guidance on context-sensitive solutions, the project manager/designer identifies "Lead Pedestrian Intervals" (LPIs) as a Type B solution that could help reduce pedestrian crashes at crossings.

7. **Review Moderate Constraints for Type B solution.** The project manager/designer reviews the set of moderate constraints (see Section 3) to determine if any of them would apply to the inclusion of LPIs in the PPA and consults BSBPP and department SMEs Core Group for guidance on potential mitigation options. In this hypothetical example, it is determined that no moderate constraints apply to this solution. Therefore, the LPI will be a solution included in the PPA.

8. **Consider Additional Solutions.** Finally, the project manager/designer considers any Type C solutions (see Section 5) that would benefit the project and the Complete Streets mission. In this hypothetical example, the project

[2] Meetings with the internal stakeholders or SMEs are called Scope Team/Core Group Meetings. These meetings will introduce the project to the SMEs, obtain information from the various SME groups and start to address concerns from all disciplines.

manager/designer identifies "high-visibility crosswalks" as another solution that would help reduce pedestrian crashes and includes this solution in the PPA.

9. **Reconcile BSBPP comments.** Throughout Steps 4 through 8, the project manager/designer, utilizing information contained in the CD Complete Streets Checklist, solicits BSBPP input on proposed solutions. In this hypothetical example, a different outcome would be that BSBPP determines the solution is inadequate (whether due to lack of communication and / or provision of inadequate documentation), suggesting implementation of a pedestrian overpass, and project manager decides against incorporating BSBPP suggested solutions. The project manager then escalates the decision to the manager/director level. At this point, the manager/director responds by supporting LPIs and striped crosswalks as the adequate solution since the pedestrian overpass is subject to a major constraint due to socio-economic impacts as discussed in Step 5, and agreement is reached at manager/director level. Scenario 2: *If an agreement cannot be reached at the manager/director level, the decision will be elevated to the Assistant Commissioner level. The issues will be resolved at the Assistant Commissioner level, and the chosen solutions will move forward as part of the PPA.* Scenario 3*: If the project manager/designer reviewed and incorporated the comments from BSBPP into CD alternatives originally, escalation of the decision may have been avoided.*

10. **Present PPA.** At the end of this process, LPIs and striped crosswalks are included in the PPA, while the Type A solution (pedestrian overpass) is not due to a documented major constraint. The Complete Streets Checklist is signed by the project manager and the reviewing SME. Following agreement on the PPA, it will then be presented to the Capital Program Screening Committee (CPSC). The PPA should be included in the project manager's package to the CPSC, describing the Complete Streets solutions as part of the PPA in the CPSC memo.

11. **(Appendix B) Prepare PE (Full Scope) Complete Streets Checklist.** After the project has graduated to the PE Phase and the designer has been selected; the PE designer reviews the PPA then prepares the PE (Full Scope) Complete Streets Checklist. The PE designer solicits input from BSBPP on the checklist. In this hypothetical example, BSBPP does not have any comments.

12. **Consider Constraint Criteria and Solutions.** The PE designer ensures the project continues to advance Complete Streets elements identified in the PPA as set forth in the New Jersey Department of Transportation's Complete Streets Policy. The project manager notifies BSBPP of any changes to the PPA selected during CD.

13. **Adopt Solutions.** The PE designer adopts LPIs and striped crosswalks as solutions in the PPA and completes the design.

14. **Submit for BSBPP (SME) Sign-Off.** The project manager signs the following Statement of Compliance in the PE Checklist:

    "The project continues to advance Complete Streets elements identified in the PPA as set forth in the New Jersey Department of Transportation's Complete Streets Policy. *It is the responsibility of the PM to notify BSBPP of any changes to the PPA selected during CD*."

    The project manager then obtains the signature of the BSBPP SME to acknowledge the solution has been adopted.

Case Study: Route 26 Limited Scope

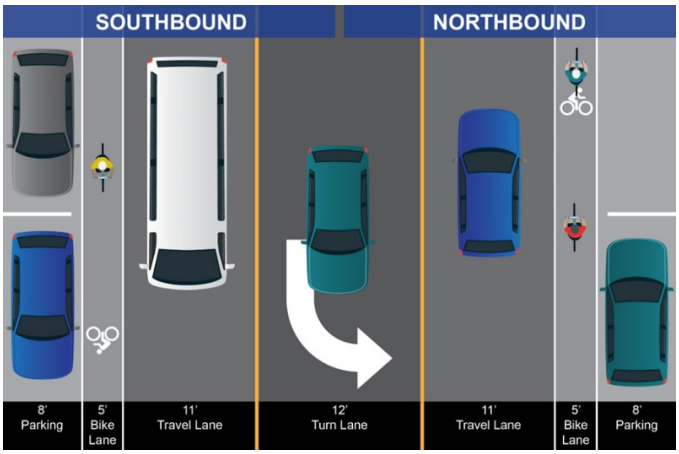
The following case study provides a step-by-step walkthrough of an existing project using the Comprehensive Solutions Approach for identifying accommodations. Notably, the Comprehensive Solutions Approach formalizes some of the processes already carried out under the Route 26 Limited Scope project. Because this is a Limited Scope project, the project manager will follow the process of Complete Streets compliance for the CD Phase and FD Phase.

FIGURE 4-1 ROUTE 26 – EXISTING

Source: NJDOT.

The purpose of the initial project was to resurface Route 26 in North Brunswick Township and the City of New Brunswick between Cox Road and Nassau Street with no change to existing striping. Additional cost-effective and compliance-based project needs were identified as part of CD, including traffic signal improvements and improved curb ramps to meet Americans with Disabilities Act (ADA) requirements. Complete Streets needs were also identified during the CD phase due to a noted gap in the bicycle network. Figure 4-2 shows the selected alternative.

FIGURE 4-2 ROUTE 26 – SELECTED ALTERNATIVE



Case Study Procedure

1. **(Appendix A) Review Complete Streets Policy and Determine Exemption.** After the project has been advanced to Concept Development Phase of the capital delivery process, project manager/designer should complete a review of the Complete Streets Policy at the earliest stages of the CD Phase. The project manager should determine whether the project qualifies for a Complete Streets Exemption. Since non-motorized users are not prohibited on the roadway within the project limits, the project is *not exempt* from Complete Streets action.

2. **Prepare Complete Streets Checklist.** A project manager/designer begins to prepare the Limited Scope CD Complete Streets Checklist. Reviewing the Limited Scope Complete Streets Checklist, the project manager/designer references a question related to the presence of existing bicycle facilities in the project area and notes the gap in the bicycle network. While completing the Limited Scope CD Complete Streets Checklist, the project manager/designer solicits input from BSBPP and other SME Units as applicable. It is acknowledged that for some of the Limited Scope projects, namely "Checklist Only Limited Scope Projects", Complete Streets checklist items may not be applicable.

3. **Submit for BSBPP (SME) Sign-Off.** The Complete Streets Checklist is signed by the project manager and the reviewing SME. The project manager/designer utilizes the checklist to evaluate Complete Streets solutions.

4. **Review Major Constraints and Consider Solutions**. Since this is a Limited Scope project, the project manager/designer determines Type A solutions are not feasible due to the major constraint that these solutions outweigh the need for implementation due to the socio-economic impacts. The project manager/designer instead begins reviewing the Type B solutions list and relevant guidance on context-sensitive solutions. Then the project manager/designer consults with BSBPP and identifies a bicycle lane (space re-allocation) as a solution that would help address the bikeway connectivity gap identified.

5. **Review Moderate Constraints.** The project manager/designer reviews the set of moderate constraints to determine if any would apply to the inclusion of a bicycle lane (space re-allocation) in the PPA. The inclusion of a bicycle lane is not subject to any of the moderate constraints. Therefore, the bicycle lane is selected for inclusion in the PPA.

6. **Consider Additional Solutions**. Lastly, the project manager/designer considers any Type C solutions, such as painted conflict areas, that would benefit the project

and the Complete Streets mission. In this example, it is assumed that there are no other identified needs.

7. **Reconcile BSBPP comments.** Throughout Steps 4 through 6, the project manager/designer, utilizing the Complete Streets Checklists, solicit BSBPPs input on proposed solutions. If BSBPP has comments, the project manager/designer will review and incorporate those comments into the revised CD alternatives. If the project manager/designer does not agree with BSBPP comments, the project manager will follow the escalation procedure outlined in Appendix A. In this hypothetical example, BSBPP does not have any comments and the Complete Streets checklist is complete.

8. **Present PPA.** Bicycle lanes are included in the recommendations for the Route 26 project, and the Complete Streets CD alternatives are presented to the Core Group, which will review it and come to a consensus on the PPA. Following agreement on the PPA, it will then be presented to the CPSC. The PPA should be included in the project manager's package to the CPSC, describing the Complete Streets solutions as part of the PPA in the CPSC memo.

9. **(Appendix B) Prepare FD (Limited Scope) Complete Streets Checklist.** The designer then prepares the FD (Limited Scope) Complete Streets Checklist (FD LS CS Checklist). The designer reviews the PPA and solicits input from BSBPP on the checklist. BSBPP does not have any comments.

10. **Consider Constraint Criteria and Solutions.** The FD designer ensures the project continues to advance Complete Streets elements identified in the PPA as set forth in the New Jersey Department of Transportation's Complete Streets Policy. The project manager notifies BSBPP of any changes to the PPA selected during CD.

11. **Adopt Solutions.** The project manager supports adding bicycle lanes as the solution presented in the PPA. In this example, BSBPP agrees with these selected solutions as adequate.

12. **Submit for BSBPP (SME) Sign-Off.** The project manager signs the following Statement of Compliance in the FD LS CS Checklist:

    "The project continues to advance Complete Streets elements identified in the PPA as set forth in the New Jersey Department of Transportation's Complete Streets Policy. *It is the responsibility of the PM to notify BSBPP of any changes to the PPA selected during CD.*"

The project manager then obtains the signature of the BSBPP SME to acknowledge the solution has been adopted.

5 DESIGN GUIDANCE

The selection and design of Complete Streets accommodations relies on understanding the project area, the needs of current and future roadway users, the effectiveness of potential solutions, and the design requirements.

A review of national best practices highlights the importance of context-sensitive Complete Streets solutions for promoting multimodal usage of streets across a variety of settings. Established national guidance from FHWA, the National Association of City Transportation Officials (NACTO), and other sources explain that the selection and design of solutions for pedestrians, cyclists, and other roadway users is sensitive to both the roadway typologies (local road, arterial, etc.) and the land use context (rural residential, suburban commercial, etc.). While these documents provide the best current knowledge related to Complete Streets, NJDOT should support new research and technologies for improving safety and mobility for all roadway users as well.

The following section outlines the various Complete Streets solutions based on their category in the NJDOT CS Policy framework (Type A, Type B, Type C), provides visual examples of solutions in different contexts, and points to relevant guidance documents for use by project managers as they seek to identify and build context sensitive solutions.

Solution Resources

To help facilitate the selection and design of solutions in the appropriate context, project managers, designers, and BSBPP can benefit from the most recent editions of the following resources:

- For all accommodation types (pedestrian, bicycle, transit, etc.) across a variety of roadway types and land use contexts, see:
  - New Jersey *Complete Streets Design Guide (Chapters 3 and 4)*
  - AASHTO *A Policy on Geometric Design of Highways and Streets (Chapters 5-9)*
  - ITE *Designing Walkable Urban Thoroughfares: A Context Sensitive Approach (Chapters 6, 8-10)*
  - NACTO *Urban Street Design Guide*
  - FHWA *Achieving Multimodal Networks: Applying Design Flexibility and Reducing Conflict*
- For pedestrian solutions specifically, see:
  - AASHTO *Guide for the Planning, Design, and Operation of Pedestrian Facilities*
  - FHWA *Pedestrian Safety Guide and Countermeasure Selection System*
- For bicycle accommodations specifically, see:
  - AASHTO *Guide for the Development of Bicycle Facilities*
  - NACTO *Urban Bikeway Design Guide*
  - FHWA *Bicycle Safety Guide and Countermeasure Selection System*
- For freight and transit accommodations and resources specifically, see:
  - NACTO *Transit Street Design Guide*
  - NJDOT *Truck Route Map*
- For solutions specifically on arterial roadways, see:
  - FHWA *Complete Streets Transformations: Six Scenarios to Transform Arterials Using a Complete Streets Implementation Strategy*

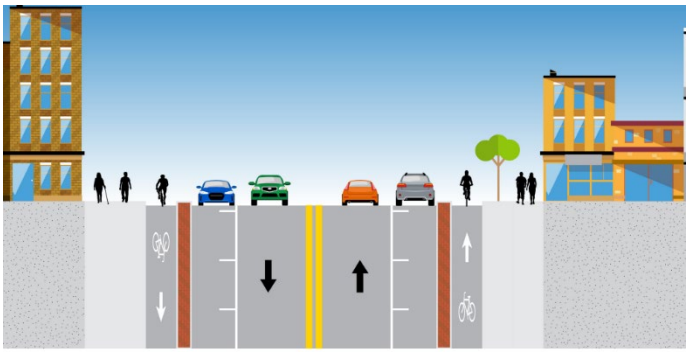
Type A Solutions

Type A solutions are high-effort solutions that typically involve new construction or significant reconstruction. Type A solutions may involve right-of-way acquisition, environmental permitting, and utility work (e.g., sidewalks, median refuge islands, protected bicycle lanes, multi-use paths, curb cuts).

TABLE 5-1 TYPE A SOLUTIONS

Pedestrian	Sidewalks
	Curb extensions
	Pedestrian overpass / underpass
	Median refuge island
	Pedestrian-actuated traffic signals (beacons)
Bicycle	Separated bicycle path
	Road diet
	Bicycle boulevard
	Protected bicycle lane
Transit	Bus turnouts
Freight	Mid-block curb cut
	Mountable curb

Curb-separated bike path on arterial road



FHWA's *Complete Streets Transformations: Six Scenarios to Transform Arterials Using a Complete Streets Implementation Strategy* guidance illustrates that for minor arterial roads in urban settings, adding curb-separated dedicated bicycle lanes can help improve safety for cyclists and pedestrians.

Median refuge island

Using the FHWA *Pedestrian Safety Guide and Countermeasure Selection System*, a pedestrian island is one of the recommended solutions for pedestrian crashes involving mid-block crossings.

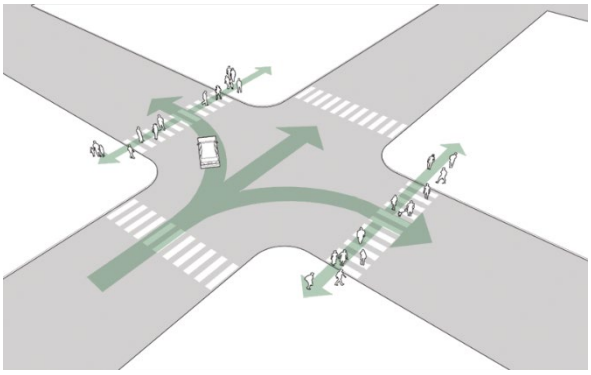
Type B Solutions

Type B solutions are medium-effort solutions that maintain the existing footprint of the roadway (minimal utility work or right-of-way acquisition, or accelerated right-of-way), lower capital costs, and can involve minor utility work and permitting (e.g., pedestrian-scale lighting, dedicated pedestrian signal phase, bicycle lanes, improved shoulders).

TABLE 5-2 TYPE B SOLUTIONS

Pedestrian	Pedestrian signal heads and pushbuttons
	Pedestrian-scale lighting
	Pedestrian detection system
	Exclusive pedestrian phase
	Lead Pedestrian Intervals
Bicycle	Bicycle lane (space re-allocation)
	Improved shoulders
	Bicycle actuation at signals (loop detectors and stencil or other means)
Freight	Dedicated signal phase

Lead Pedestrian Intervals



In the New Jersey *Complete Streets Design Guide*, Lead Pedestrian Intervals (LPIs) are a suggested treatment for intersections with high vehicular turning volumes, with a recommended lead interval of 3 to 7 seconds.

bicycle detection at signals

According to the NACTO *Urban Bikeway Design Guide*, bicycle detection at actuated signals can help improve the efficiency and reduce the delays for bicycle travel.

Type C Solutions

Type C solutions are low-effort solutions that are limited to painting and signage, as these solutions have a minimal effect on project schedule or cost (e.g., striped crosswalks, signage and wayfinding, painted conflict areas).

TABLE 5-3 TYPE C SOLUTIONS

Pedestrian	Striped crosswalks
	Pedestrian signs for crossing and wayfinding
	High-visibility crosswalks (ladder or zebra)
Bicycle	Signs, signals, and pavement markings specifically related to bicycle operation on roadways or shared-use facilities
	Bicycle-safe drainage grates
Transit	Signage
Freight	Dedicated curb space / loading zones (signage for new curbside programming)
	Painted conflict area

High-visibility crosswalks

NACTO's *Urban Street Design Guide* states that high-visibility ladder, zebra, and continental crosswalk markings are preferable to standard parallel or dashed pavement markings, as they are more visible to approaching vehicles and have been shown to improve yielding behavior.

Street pedestrian crossing signs

The FHWA *Pedestrian Safety Guide and Countermeasure Selection System*, notes that in-street pedestrian crossing signs may be appropriate on 2-lane or 3-lane roads where speed limits at 30 mph or less.

6 COORDINATION AND MONITORING

Complete Streets Routine Coordination and Updates

NJDOT staff working under the Section Chief of Complete Streets Implementation will facilitate the implementation of the Complete Streets Policy along with routine coordination, updates, and exploration of alternative avenues for project advancement within various units of the Department. NJDOT will establish and maintain a Complete Streets Steering Committee, consisting of functional areas within the Department, to coordinate and guide implementation of the Policy and use of this Complete Streets Implementation Handbook.

Regular consultation and coordination regarding Complete Streets policy and implementation is crucial to ensuring the policy is being enacted in line with its intent. Table 6-1 outlines the minimum frequency of meetings between BSBPP and other relevant divisions within the Department to discuss policy and implementation.

TABLE 6-1 ROUTINE COORDINATION SCHEDULE

DIVISION	MINIMUM MEETING FREQUENCY WITH BSBPP
CPM	Biannually
Operations	Annually
Local Aid	Biannually
Transportation Data & Support	Biannually

Staff members will also support the updating of materials, creating and updating the central NJDOT Complete Streets website and repository, and tracking future Complete Streets performance measures.

Other divisions that interact with Complete Streets implementation should continue to pursue efforts which support the mission. For example, the Division of Local Aid should incentivize communities applying for Local Aid grants to document implementation of Complete Streets projects in addition to the incentive for having adopted a Complete Streets policy.

Performance Tracking

NJDOT staff in the Bureau of Safety, Bicycle and Pedestrian Programs will work alongside project managers to collect and track Complete Streets Performance Measures. Such measures may include program inputs (institutional accomplishments), quantitative measures, and output metrics, such as:

- Mileage of new and existing bicycle infrastructure, broken out by facility type (bike lanes, separated bike lanes, protected bike lanes, sharrows, trails, etc.)
- Linear feet of new and existing pedestrian and bicycle infrastructure (sidewalks, shared-use paths, etc.)
- Number and type of new and existing ADA compliant installations (curb ramps, pedestrian signals, etc.)
- Count data from a non-motorized count program and other available sources
- Bicycle and pedestrian crash data
- Before and after case studies
- Number of exemptions granted by project type/phase and the rationale for exemptions
- Number and dollar amount of Bicycle and Pedestrian Planning Assistance studies and Local Aid grants distributed to communities of concern
- Number and type of targeted Complete Streets outreach, training, and educational events
- Major accomplishments in infrastructure expansion/connectivity

7 RESOURCES

The following section provides resources identified as key components for implementing Complete Streets in New Jersey and best practice guidance to be applied on various aspects of accommodation selection and design.

Checklists

- CD Complete Streets Checklist for Limited and Full Scope Projects
- Full Scope PE Complete Streets Checklist
- Limited Scope FD Complete Streets Checklist

Guidance and Design

The following local and national resources provide guidance on Complete Streets principles and design. The current adopted standards shall always take precedence.

Local Guidance

- NJDOT *Roadway Design Manual*: The manual presents the current Department guidelines pertaining to roadway design on the State Highway system. It provides a means of developing uniformity and safety in the design of a roadway system consistent with the needs of the motoring and non-motoring users.

- *New Jersey Complete Streets Design Guide*: The New Jersey Complete Streets Design Guide is a planning document that presents tools and methodologies for designing Complete Streets in a variety of settings, with attention to the specific needs of each community.

National Guidance

- AASHTO *Guide for the Planning, Design, and Operation of Pedestrian Facilities*: This document provides guidance on the planning, design, and operation of pedestrian facilities along and across streets and highways. Specifically, the guide focuses on identifying effective and appropriate measures for accommodating pedestrians on public rights-of-way, which vary among roadway and facility types.

- AASHTO *A Policy on Geometric Design of Highways and Streets*: This document incorporates recent research that provides insight into the effect of specific geometric design elements of roads and streets for all transportation modes. It also introduces the consideration of five specific context classifications as an element of the geometric design process and emphasizes the consideration of multimodal needs in design.

- AASHTO *Guide for the Development of Bicycle Facilities*: This guide provides information on how to accommodate bicycle travel and operations in most riding environments. It is intended to present sound guidelines that result in facilities that meet the needs of bicyclists and other highway users. Sufficient flexibility is permitted to encourage designs that are sensitive to local context and incorporate the needs of bicyclists, pedestrians, and motorists.

- ITE *Designing Walkable Urban Thoroughfares: A Context Sensitive Approach*: This resource provides guidance for the design of walkable urban thoroughfares in places that currently support walking and in places where the community desires to provide a more walkable thoroughfare, and the context to support them in the future.

- NACTO *Transit Street Design Guide*: This document provides design guidance for the development of transit facilities on city streets, and for the design and engineering of city streets to prioritize transit, improve transit service quality, and support other goals related to transit. The guide is based on other design guidance, as well as city case studies, best practices in urban environments, research and evaluation of existing designs, and professional consensus.

- NACTO *Urban Street Design Guide*: A blueprint for designing 21st century streets, this guide unveils the toolbox and the tactics cities use to make streets safer, more

livable, and more economically vibrant. It outlines both a clear vision for complete streets and a basic road map for how to bring them to fruition.

- NACTO *Urban Bikeway Design Guide*: The purpose of the NACTO Urban Bikeway Design Guide (part of the Cities for Cycling initiative) is to provide cities with state-of-the-practice solutions that can help create complete streets that are safe and enjoyable for bicyclists.

- FHWA *Manual on Uniform Traffic Control Devices*: The MUTCD defines the standards used by road managers nationwide to install and maintain traffic control devices on all public streets, highways, bikeways, and private roads open to public travel.

- FHWA *Achieving Multimodal Networks: Applying Design Flexibility and Reducing Conflict*: This publication is intended to be a resource for practitioners seeking to build multimodal transportation networks. The document highlights ways that planners and designers can apply the design flexibility found in current national design guidance to address common roadway design challenges and barriers. It focuses on reducing multimodal conflicts and achieving connected networks so that walking and bicycling are safe, comfortable, and attractive options for people of all ages and abilities.

- FHWA *Pedestrian Safety Guide and Countermeasure Selection System*: This resource is intended to provide practitioners with the latest information available for improving the safety and mobility of those who walk. The online tools provide the user with a list of possible engineering, education, or enforcement treatments to improve pedestrian safety and/or mobility based on user input about a specific location.

- *FHWA Bicycle Safety Guide and Countermeasure Selection System:* This resource is intended to provide practitioners with the latest information available for improving the safety and mobility of those who bike. The online tools provide the user with a list of possible engineering, education, or enforcement treatments to improve bicycle safety and/or mobility based on user input about a specific location.

- FHWA *Complete Streets Transformations: Six Scenarios to Transform Arterials Using a Complete Streets Implementation Strategy*: This document provides examples of how to apply a Complete Streets Implementation Strategy to transform arterials that pose significant safety, connectivity, and equity challenges. It provides six hypothetical scenarios of how common arterial corridor configurations can be transformed to accommodate the needs of different users by implementing Complete Streets.

Training

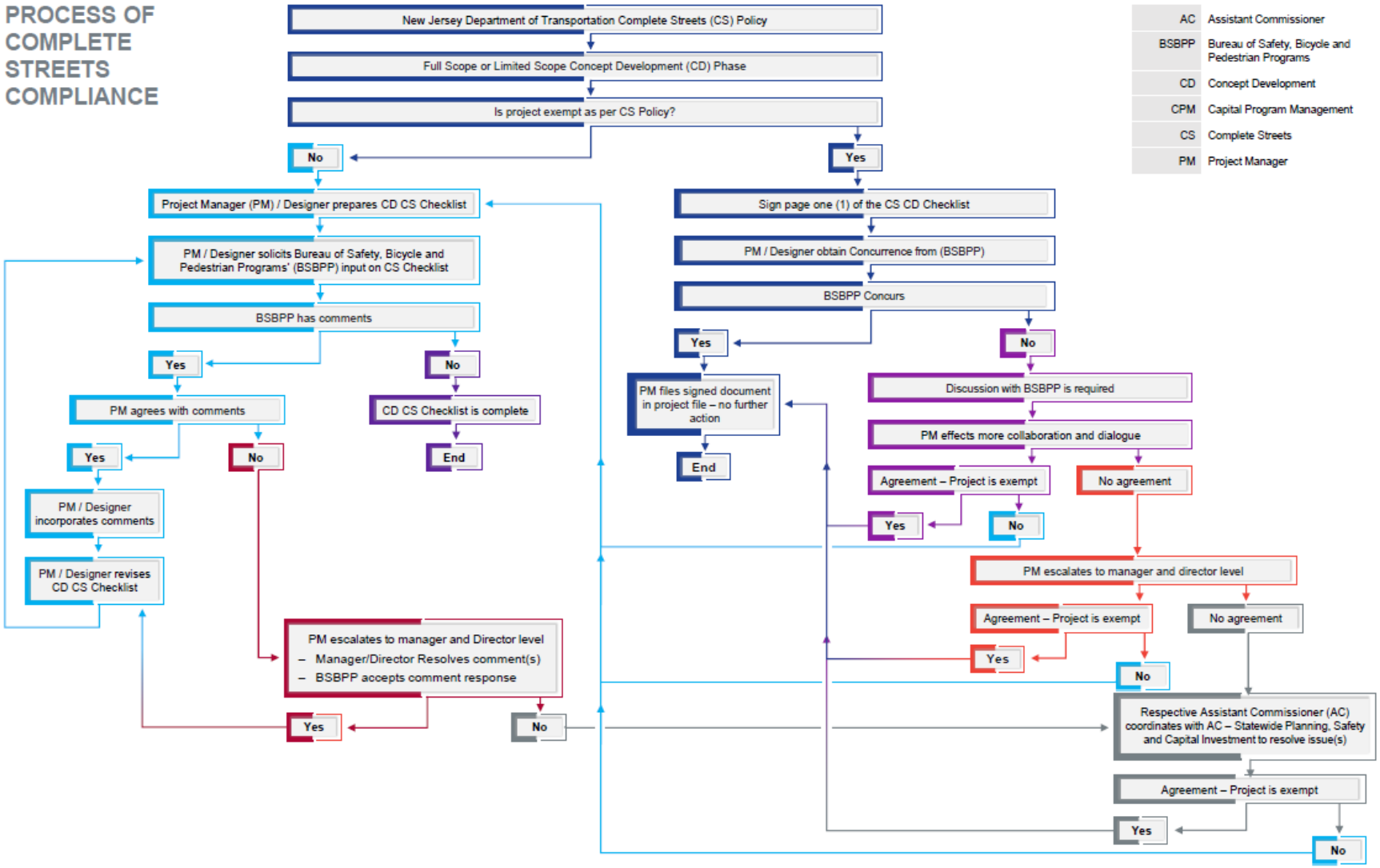
NJDOT provides a number of workshops and trainings led by national and state experts for public and private engineers and planners on Complete Streets. NJDOT should continue to conduct periodic Complete Streets training for internal and external partners, planners, engineers, consultants, and decision makers. NJDOT supplements these trainings with the New Jersey Bicycle and Pedestrian Resource Center (BPRC) to promote the passage of Complete Streets policies and provide technical assistance to municipalities and counties with implementation.

A curriculum has been developed for Complete Streets policy development, design, and implementation, as well as resources on best practices to help municipalities and counties develop and implement Complete Streets policies. The BPRC website and the Complete Streets Repository websites include these items, as well as several Complete Streets presentations and an inventory of county and local policies.

The BPRC also hosts a bi-annual Complete Streets Summit, bringing together engineers, planners, health professionals, advocates, youth organizers, elected officials, and others involved in implementing Complete Streets. The Summit, sponsored by NJDOT, provides information through panel discussions and presentations on topics such as Complete Streets policy adoption, lessons learned from implementation, design issues, and funding resources. Counties and municipalities are recognized for adopting or updating Complete Streets policies and local projects, while programs and champions are presented with awards for significant contributions to Complete Streets in New Jersey. Information on and summaries of the bi-annual summits, as well as case studies from around the state, are available on the New Jersey Bicycle and Pedestrian Resource Center website.

8 APPENDIX

Appendix A – Process of Complete Streets Compliance (CD Phase)



Appendix B - Process of Complete Streets Compliance (PE & FD Phases)