CHICAGO COMPLETE STREETS

CHAPTER THREE: DESIGN GUIDANCE

The previous section focused on assembling and applying planning-level information at the beginning of a project. This chapter provides design guidance for creating complete streets. This section describes design trees, which serve as a starting point for the street cross section. It then provides flow charts of best practices for decision making, specifically what to prioritize in design. Lastly, geometric and operational policies are described that are supportive of complete street principles.
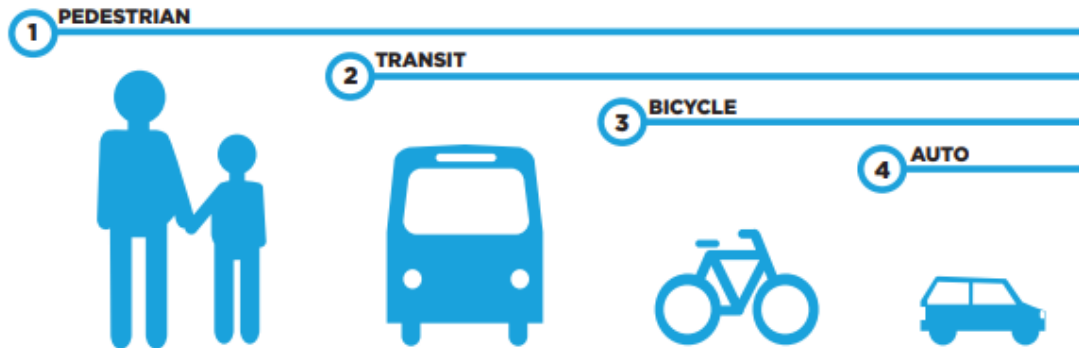
3.1 Modal Hierarchy

CDOT will use *modal hierarchies* to inform design and operation decisions. The default hierarchy is: **Pedestrian > Transit > Bicycle > Automobile**. Project-specific alternative hierarchies may be submitted for Compliance Committee approval. Some possible hierarchies include:

» **Transit > Pedestrian > Bicycle > Automobile** - along a major transit corridor

» **Bicycle > Pedestrian > Transit > Automobile** - along a bicycle priority street with bikeways or a bicycle boulevard

» **Automobile > Pedestrian > Bicycle > Transit** - in an industrial corridor or along a parkway with no bus service

Direction, Observation, Iteration

Complete streets design requires direction, observation, and iteration. 1) *Direction* requires both leadership and support: leadership to establish CDOT policies and priorities, and support of the resulting projects and staff who implement them. 2) Street design is not simply a technical or quantitative exercise that should remain fixed for generations. Rather, street design requires *observation* of how people use the space, from drivers to people sitting on stoops. It is with these observations that we can craft the best design. 3) Unlike highway design, street design is *iterative*. At freeway speeds, one needs uniformity and consistency. As speeds slow, options expand. With more possibility comes the need to experiment and adjust based on how users react. The design of a street can always be improved.

① PEDESTRIAN
② TRANSIT
③ BICYCLE
④ AUTO

Pedestrian First Modal Hierarchy

3.2 Design Trees

After the street typology and modal hierarchy have been established, *design trees* will guide cross-section selection, see Figure 19. The design trees contain the following three parameters:

» Modal Hierarchy – from 3.1 above.

» Building Typology – from 2.1.1 above.

» Roadway Typology – from 2.1.2 above.

This contains general parameters on speed, volume and width.

Additional design trees are contained in Appendix B.

Dimensions are not listed in the design trees, as they are meant to provide general direction and guidance during project scoping. Dimensions are provided in Cross section Assemblage below (see 3.2.1). Sample cross sections are provided in Appendix C.

Volume and Speed are Outputs

Traditional street design process begins with automobile volume and speed as main inputs. This process inverts that approach by looking first at the building and roadway typology. Following the design trees, automobile volume and speed become outputs.
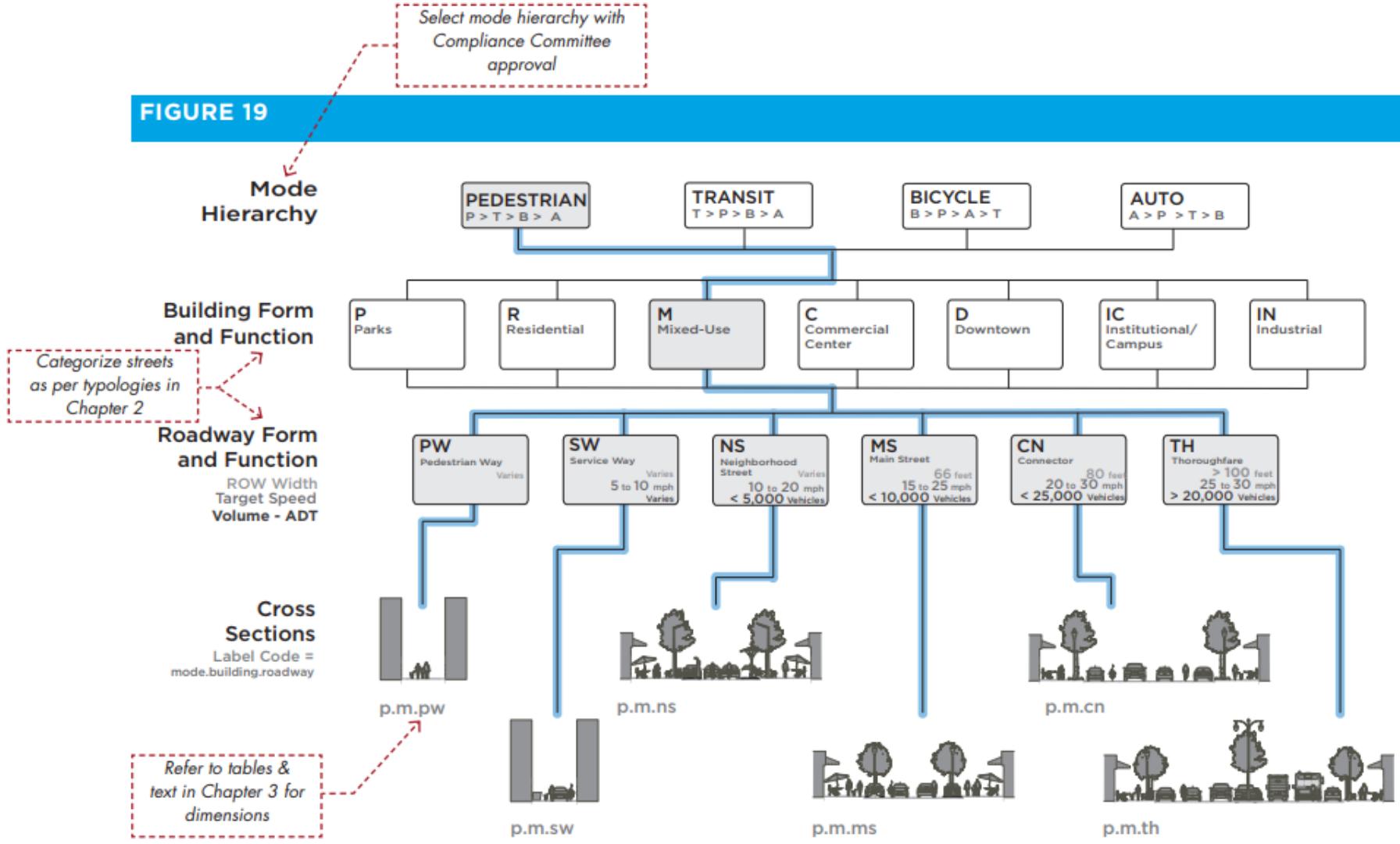
Community Engagement

Design trees are intended to help engage the community through the process of street selection and design.

Ecological Design

Regardless of spatial allocation for different uses through the design tree process, CDOT can achieve better ecological performance from its streets, above and below grade. As noted, the goal is to minimize the paved area.
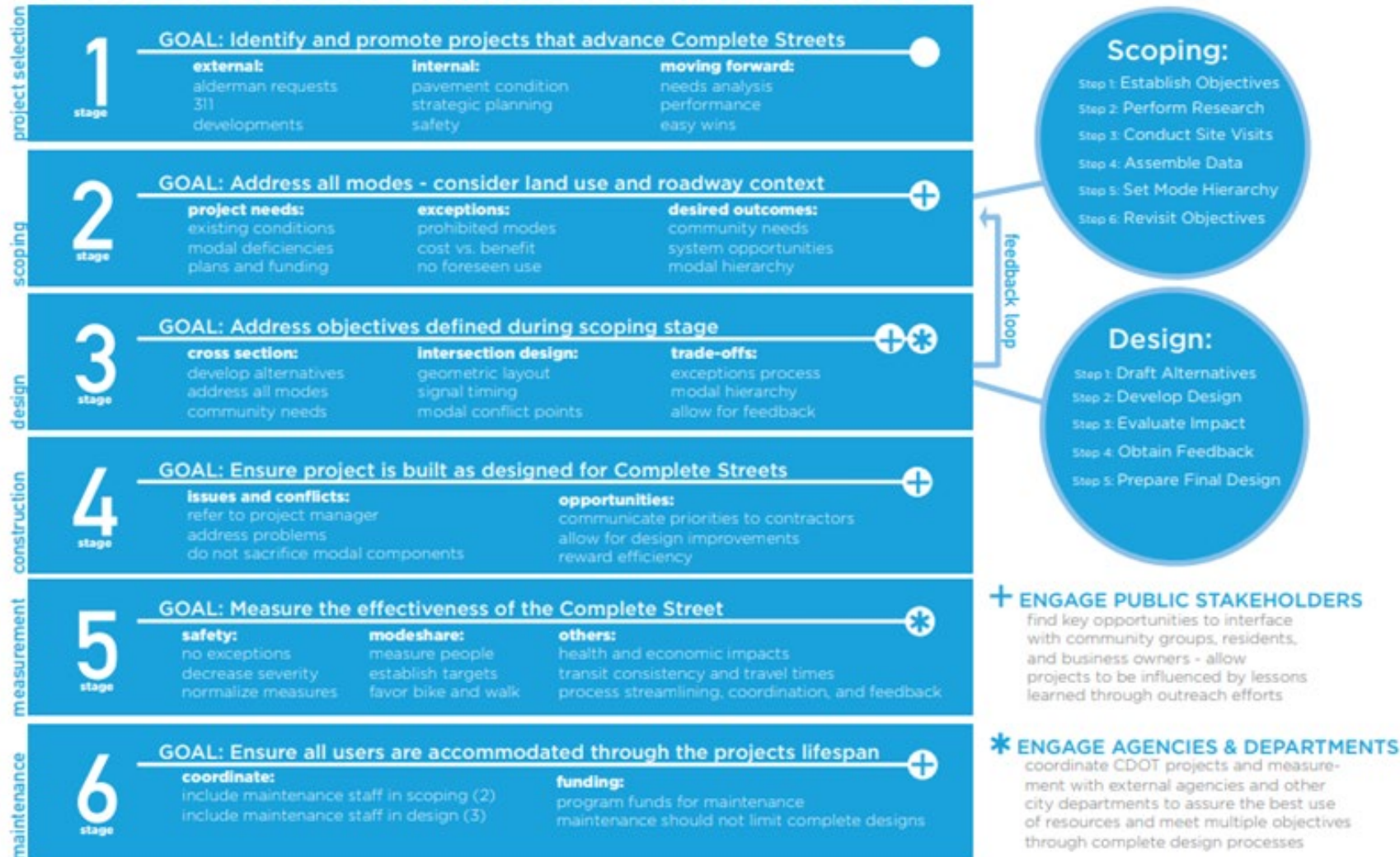
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FIGURE 19

Select mode hierarchy with
Compliance Committee
approval

Mode Hierarchy

PEDESTRIAN	TRANSIT	BICYCLE	AUTO
P > T > B > A	T > P > B > A	B > P > A > T	A > P > T > B

Building Form and Function

P Parks	R Residential	M Mixed-Use	C Commercial Center	D Downtown	IC Institutional/ Campus	IN Industrial

Categorize streets as per typologies in Chapter 2

Roadway Form and Function

ROW Width
Target Speed
Volume - ADT

PW Pedestrian Way	SW Service Way	NS Neighborhood Street	MS Main Street	CN Connector	TH Thoroughfare
Varies	Varies 5 to 10 mph Varies	Varies 10 to 20 mph < 5,000 Vehicles	66 feet 15 to 25 mph < 10,000 Vehicles	80 feet 20 to 30 mph < 25,000 Vehicles	> 100 feet 25 to 30 mph > 20,000 Vehicles

Cross Sections

Label Code =
mode.building.roadway

p.m.pw

p.m.ns

p.m.cn

p.m.sw

p.m.ms

p.m.th

Refer to tables & text in Chapter 3 for dimensions

Design Tree for Mixed-Use

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§ 40-40

Complete Streets Project Delivery Process

FIGURE 40 - COMPLETE STREETS AND SUSTAINABILITY PROJECT DELIVERY: Steps by Project Type, Updated 2014

CDOT PROJECT TYPES (select one)	1.1 Identify Project Initiation	1.2 Identify Project Budget	2.1 Establish Project Goals & Requirements	2.2 Research	2.2.1 Examine Crash Report Summaries	2.2.2 Examine Relevant Planned/Programmed Roadway Projects	2.2.3 Examine Neighborhood and Modal Plans	2.2.4 Examine Notable Developments In or Near Project Area	2.2.5 Review Prior Transportation & Traffic Studies	2.2.6 Examine Existing Sustainability Data Sets	2.2.7 Summarize Prior Public Engagement	2.2.8 Update Budget	2.3 Site Visits	2.3.1 Initial Observation	2.3.2 Observation checklist	2.3.3 Building Form and Function	2.3.4 Roadway Form and Function	2.3.5 Typical Sections	2.3.6 Intersection and Mid-block Crossing Worksheets	2.4 Mapping and Analysis	2.4.1 Generate and Analyze Typology Maps	2.4.2 Generate and Analyze Activity Maps	2.4.3 Generate and Analyze Volume Maps	2.4.4 Generate and Analyze Crash Maps	2.4.5 Identify Preliminary Sustainability Strategies	2.4.6 Create Outreach Plan	2.5 Modal Deficiencies & Hierarchy	2.6 Revisit Project Goals and Environmental Requirements; Formalize Strategies	3.1 Create Design Alternatives	3.1.1 Summarize Project Information from Scoping	3.1.2 Cross Section Development	3.1.3 Perform Sustainability Calculations	3.1.4 Identify Sustainable Features	3.1.5 Initial Public Engagement	3.2 Schematic Design	3.2.1 Analyze Crashes and Design for Safer Streets	3.2.2 Apply Street and Intersection Designs and Policies
ADA ramp improvements	x	x	x			x						x		x							x				x	x	x		o				x				
Alley improvements	x	x	x			x			o	o	x			x	x						o				x		x	x		x				x	x			
Arterial resurfacing	x	x	x		x	x	o	x	x	x		x		x	x	x	x	x	x		o		o	o	x	x	x	x		x	x	x	x	x		x	x
Bike facility projects	x	x	x		x	x	x	x	x	x	x	x		x	x	x	x	x	x		o	o	o	x	x	x	x		x	x	x	x	x	x		x	x
Bike Stations	x	x	x			x	x	x		x		x		x	x						x	o			x	x	x	x		o			x	x	x		
Bridge repair	x	x	x			x		x	x	x		x		x	x							x			x		x	x					x	x			
Bridge Replacement/New	x	x	x		x	x	x	x	x	x		x		x	x	x	x	x	x		x	o	x	x	x	x	x		x	x	x	x	x	x		x	x
Child Safety Zones	x	x	x		x	x	o	x	x			x		x	x	o	o	o	x		o			x	x	x	x		o	o	x	x	x	x		x	x
CREATE/rail projects	x	x	x			x	x	x	x	x	x	x		x	x	x								x	x	x	x		x	x	x	x	x		x		
Landscaped median imprvs	x	x	x		x	x	x	x	x	x	x	x		x	x	x	x	x	x		x	o	x	x	x	x	x		x	x	x	x	x		x	x	
Lighting projects	x	x	x			x			x		x			x								o	o	o	x								x	x			o
Major Roadway Reconstruction/Realignment Project	x	x	x		x	x	x	x	x	x	x	x		x	x	x	x	x	x		x	o	o	x	x	x	x		x	x	x	x	x		x	x	
Ped safety infrastructure improvements	x	x	x		x	x	x	x	x		x	x		x	x	x	x	x	x		x	o	x	x	x		x	x		x	o	x	x	o		x	x
Placemaking Activities	x	x	x			x	x	x	x		x	x		x								x			x		x	x		o	o	x	x	o			x
Red light/Speed cameras	x	x	x		x	x		x	x		x	x		x	x								x	x	x		x	x					x			x	
Riverwalk Projects	x	x	x			x	x	x	x	x	x	x		x		x									x	x	x	x				x	x	x			x
Sidewalk and miscellaneous concrete projects	x	x	x			x						x		x								o			x		x	x					x	x			x
Signage & pavement marking improvements	x	x	x		x	x						x		x	x		x		x		o				x	x	x	x		x	x		x	x		o	x
Signal modernizations, new signals, signal interconnects	x	x	x		x	x	x	x	x		x	x		x	x	x	x	x	x		x		x	x	x		x	x					x			o	o
Streetscaping projects	x	x	x		x	x	x	x	x	x	x	x		x	x	x	x	x	x		x	o	x	x	x	x	x		x	x	x	x	x		x	o	x
Traffic Calming	x	x	x		x	x	x	x	x		x	x		x	x	x	x	x	x		o	o	x	x	x	x	x					x			x	o	x
Transit projects	x	x	x		x	x	x	x	x	x		x		x	x	x	x	x	x		x	o	o		x	x	x		x	o	x	x	x				x
Tree planting and landscape	x	x	x									x		x											x								x	x			
WPA/industrial streets	x	x	x		x	x	x	x				x		x	x						x				x	x	x	x		x	x	x	x	x			x

KEY: x = required, o = optional, blank = not required

FIGURE 40 - COMPLETE STREETS AND SUSTAINABILITY PROJECT DELIVERY: Steps by Project Type, Updated 2014

Stage 4: Construction — Goal: Ensure project is built as designed for Complete Streets
Stage 5: Measurement — Goal: Measure the effectiveness of the Complete Street
Stage 6: Maintenance — Goal: Ensure all users are accommodated for lifespan

CDOT PROJECT TYPES (select one)	3.2.3 Create Geometric Layout	3.2.4 Conduct Signal Timing Analysis	3.2.5 Conduct Traffic Impact Studies	3.2.6 Review Intersection Design	3.2.7 Verify sustainable requirements or request variance	3.3 Obtain Feedback and Approvals	3.3.1 Engage Internal Partners	3.3.2 Engage External Agencies	3.3.3 Engage Public Stakeholders	3.4 Design Impact Evaluation	3.4.1 Calculate Projected MMLOS	3.4.2 Conduct Stormwater Modeling	3.4.3 Perform Sustainability Valuation	3.5 Prepare Preferred Alternative	3.6 Record Design Outputs	4 Construction	4.1 Communicate project objectives to staff and contractors	4.2 Consider design changes and impact on Sustainable objectives & hierarchy	4.3 Address any MOT Issues	4.4 Public Outreach	4.5 Practice Sustainable Construction per Volume II	5 Measurement	5.1 Safety	5.2 Modeshare	5.3 Process Efficiency	5.4 Stakeholder satisfaction	5.5 Health	5.6 Economic prosperity	Security	5.7 Ensure Commissioning & Monitoring plan is being implemented	6 Maintenance	6.1 Identify Maintenance Needs	6.2 Establish Program Maintenance and Replacement Cy	6.3 Program Funding for Maintenance	6.4 Identify CS Improvements During Maintenance*
ADA ramp improvements	x				x									x	x		x		x	o	x				o					x					x
Alley improvements					x									x	x		x		x	x	x				x					x		x			o
Arterial resurfacing	x	x	x	x	x		x	x	x		o			x	x		x	x	x	o	x		x	x	x					x					o
Bike facility projects	x	x	x	x	x		x	x	x		o			x	x		x	x		x	x		x	x	x	x		x		x					o
Bike Stations	x				x		x	x	x					x	x		x				o		x	x		o		x		x					o
Bridge repair	x				x		x	x						x	x		x		x	o	x					x		x		x		x	x	x	o
Bridge Replacement/New	x	x	x	x	x		x	x	x		o		x	x	x		x	o	x	x	x		x	x	x	x	x			x		x	x	x	o
Child Safety Zones	x	o			x		o	o	x		o			x	x		x			x			x	x		o				x					
CREATE/rail projects	x	x	x	x	x		x	x	x		o			x	x		x	o	x	x	x			x	x		x	x		x					o
Landscaped median imprvs	x				x		x	x	x					x	x		x			o	x		x	x	x			x		x		x		x	o
Lighting projects					x		x	x				x	x	x	x		x			o	x		x			x				x		x	x	x	o
Major Roadway Reconstruction/Realignment Project	x	x	x	x	x		x	x	x		o	x	x	x	x		x	o	x	x	x		x	x	x	x	x			x		x	x	x	o
Ped safety infrastructure improvements	x	x		x	x		x	x	o		o			x	x		x		x	o	x		x	x	x	x		x		x					x
Placemaking Activities	x	o			x		o	o	o		o			x	x					x								x		x		x			
Red light/Speed cameras		x			x										x		x			x			x							x		x			
Riverwalk Projects	x				x		x	x	x			x	x	x	x					o								x		x		x			
Sidewalk and miscellaneous concrete projects	x				x		x	x						x	x				x	o	x		x	x	x			x		x					x
Signage & pavement marking improvements	x	x	o		x		x	x			o			x	x					o			x							x				x	x
Signal modernizations, new signals, signal interconnects	x	x	x	x	x						o			x	x				x	o			x		x		x			x		x	x	x	
Streetscaping projects	x	x		x	x		x	x	x		o		x	x	x		x	x	x		x			x	x	x		x		x					
Traffic Calming	x	x			x		x	x	x					x	x			x		o			x							x		x			o
Transit projects	x	x	x	x	x		x	x	x		o			x	x		x	x	x		x		x	x	x		x	x		x		x	x	x	
Tree planting and landscape					x		x	x	x						x						x					x		x		x					o
WPA/industrial streets	x						x	x	x					x	x		x	x	x		x							x		x					o

KEY: x = required, o = optional, blank = not required

4.3 Arterial Resurfacing Program

The arterial resurfacing program currently uses a condition-based pavement assessment system to allot resurfacing equally among geographical zones and wards. This program is an excellent means for CDOT to make more streets "complete". Following are initial descriptions of measures to add to the assessment system, to be finalized by a working group.

1. Deficits

    a. Prioritize streets with crash records in the top 25th percentile. Require 25 percent of resources to projects so selected.

    b. Prioritize streets that lack basic non-motorized and/or transit facilities such as:

        i. Sidewalks

        ii. Crossing opportunities (see 3.4.5)

        iii. Bicycle routes identified in *Streets for Cycling 2020 Plan*

        iv. Transit shelters or crossings at every bus stop

2. Opportunities

    a. Prioritize streets identified in a CTA or City plan as a bicycle, pedestrian, or transit-priority; urban heat island hot spot; or sewer sensitivity zone.

    b. Prioritize streets with four or more lanes and less than 30,000 average daily traffic for their potential for lane narrowing and road diets.

    c. Prioritize streets with vehicle lanes that exceed 10 feet in width. They will be targeted for lane narrowing, additional bicycle facilities and/or sidewalk expansions.

    d. Capitalize on opportunities to include high visibility crosswalks, bike lanes, narrower lanes, curb extensions, pilot projects, and so on. In other words, do not simply restripe the existing conditions. This likely will require programming funds and allowing time in the project schedule for more extensive design engineering services, possibly including efforts to secure Categorical Exclusion – Group 2 (CE-2) environmental processing for federally-funded arterial resurfacing.