Elgin O'Hare - West Bypass: Roadway Concept Design Guidelines

PREPARED FOR: Illinois Department of Transportation

PREPARED BY: CH2M HILL

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A. Background

Project Concept Design Guidelines define the basic "ground rules" that will be followed to ensure that the alternatives development and evaluation process complies with appropriate design policies and practices. These guidelines are supported by a set of more detailed Design Criteria that will be followed to ensure that the proposed concept design is consistent with applicable design standards. Thus, the Concept Design Guidelines represent the basis design philosophy underlying the development of the concept design for alternatives to be considered with the EO - WB project.

Two basic types of alternatives will be developed: the No-Action Alternative and Build Alternatives. The No-Action Alternative is the baseline condition for comparison of the various transportation system alternatives or Build Alternatives and must be carried through the entire alternatives development process in accordance with federal (NEPA) project development procedures.

The overall alternatives development process will consider a full range of Build Alternatives in the study area based on technical analysis, stakeholder input, and environmental constraints. The Build Alternatives will be comprised of multi modal system improvement strategies that include improvements to existing facilities, construction of new facilities, and appropriate transportation operational technologies and demand management strategies.

For purposes of the Tier One EIS process, alternatives will be developed at a conceptual design level of detail suitable to support identification of the Preferred System Alternative for the study area. The level of design detail is less than that included in a traditional IDOT Phase 1 planning/environmental study. During the EO – WB Tier One EIS process, alternatives will be developed to the level of detail required to enable stakeholder review of Build Alternatives, to support travel demand modeling and system transportation performance analyses, and to permit a GIS-based evaluation of social, environmental and economic impacts. It is anticipated that Build Alternatives will include roadway, transit, bike/pedestrian improvement features, and that they will incorporate, where appropriate, travel demand (TDM) and system management (TSM) strategies.

A discussion of the roadway concept design guidelines is presented in the remainder of this document.

B. Roadway Concept Design Guidelines for Build Alternatives

Build Alternatives will include existing and/or new roadway corridors proposed for improvement. Alternatives will be developed to a concept design level of detail, defining the following features: proposed corridor location (termini and working horizontal alignment), number of lanes, interchanges (new or improved interchange locations/types

with working horizontal alignment/layout), working vertical alignment for mainline corridors, off-system roadway improvements, access concept for adjacent properties, and conceptual structure locations. The level of concept design development will be adequate to support identification of the required construction footprint and to permit an analysis of planning-level costs. At this stage, the objective is to identify workable design layouts for representative alternatives, with the understanding that Tier Two studies will focus on optimizing the geometric and design features of the Recommended Alternative.

Roadway improvements included in the Build Alternatives will be developed on the basis of design guidelines presented below and preliminary design criteria presented in Table 1.

1. **Priority of Movements for Route Continuity**

    - Existing freeways/tollways will have the highest priority for route continuity considerations
    - If Elgin-O'Hare and West Bypass are provided with a Build Alternative, they will have equal priority
    - If a Build Alternative provides partial segments of the Elgin-O'Hare and the West Bypass, the Elgin-O'Hare and the south connection to I-294 will have higher priority than the north connection to I-90 due to travel demand/travel desires

2. **Preliminary Basic Lane Requirements**

    - Elgin-O'Hare Extension:
        - West Bypass to IL 83: 6 lanes (3 lanes each direction)
        - IL 83 to Meacham Road: 8 lanes (4 lanes each direction)
    - Elgin O'Hare Expressway Widening:
        - Meacham Road to Roselle Road: (4 lanes each direction)
        - Roselle Road to Irving Park Road/Gary Ave (3 lanes each direction)
    - West Bypass: 6 lanes (3 lanes each direction)
    - Existing freeway/tollways: basic laneage will not change
    - Arterials (requiring extended capacity improvements): 2030 Baseline condition + 1 lane in each direction

3. **General Access Considerations**

    - Full system interchanges will initially be provided at all proposed system connections, with the understanding that the viability of eliminating redundant movements will be evaluated during the preparation of draft Access Justification Reports (AJR)
    - Full service interchanges will be provided as appropriate to facilitate access to major roadway corridors with the objective of accommodating local access requirements in conformance with FHWA interstate access policies
    - FHWA approval will be required for partial access interchanges
    - Access to all adjacent properties will be provided, or if not possible the property will be identified as a displacement

4. **Lane Balance/Lane Continuity**

    - Will be provided with each Build Alternative for mainline ramp movements. Accommodating lane balance on Collector-Distributor Roads and turning roadways is preferred and will be considered during the development of concept design

5. **Existing Roadway Infrastructure Re-Use**

    - A full reconstruction for any existing roadway corridors/interchanges proposed for improvement will be assumed, with minimal consideration of salvaging major structural elements

6. **Ramp Considerations**

    - Loop ramps may be considered within system interchanges where viable based on traffic demand operations and safety
    - Single exit ramps will be the preferred treatment at system interchanges
    - Left-hand ramps will not be used

7. **Interchange Types**

    - Various interchange options may be investigated during Tier One, with a focus on identifying one viable representative interchange type(s) for each proposed access location.
    - Detailed interchange type studies will be performed with future Tier Two studies.

8. **Design Speed**

    - Freeway/tollway design speed: 70 mph
    - Directional ramp design speed: 50 mph with proper acceleration and deceleration length
    - Loop Ramp Design Speed: 25 mph or greater with proper acceleration and deceleration length
    - Arterial design speed: 50 mph (rural); 45 mph (urban with curb and gutter)

9. **Level of Service (LOS)**

    - Proposed Mainline LOS for 2030 (design year): LOS C (desirable) (LOS D with design exception)
    - Proposed Arterial LOS for 2030 (design year): LOS C (LOS D with design exception)

10. **FAA Design Considerations**

    - Airport Runway Protection Zones (RPZ) will be fully accommodated

11. **Accommodation of Multi-Modal Improvements**

    - Representative conceptual layouts for proposed roadway improvements will be developed to accommodate proposed new transit services (e.g. high-type dedicated transit corridors, intermodal centers) and new bicycle/pedestrian accommodations (e.g. dedicated trails, trail crossings).

Elgin O'Hare - West Bypass
Preliminary Design Criteria: Mainline and Interchanges - IDOT

Criteria	IDOT Mainline	IDOT C-D Road	Reference/Comments	IDOT Interchange Ramps			Reference/Comments
				SYSTEM	SERVICE		
				Directional & Semi-Directional	Diamond & Outer Connection	Loop	
GENERAL ELEMENTS							
Design Speed	70 mph	40-50 mph urban 50 mph rural	IDOT BDE Manual Fig. 44-5A, IDOT BDE Manual 37-4.02(b)	Directional: 50 mph Semi-Directional: 40 - 50 mph	Diamond: 50 mph to 25 mph Outer: 50 mph (Des.) / 45 mph (Min.)	30 mph (Des.) / 25 mph (Min.)	IDOT BDE Manual 37-4.04
Level of Service (Minimum)	C	---	IDOT BDE Manual Fig. 44-5A	---			
Design Vehicle	WB-65	WB-65	---	WB-65			IDOT BDE Manual 37-5.01
Sight Distance							
Stopping Sight Distance	730 ft		IDOT BDE Manual Fig. 31-3A				
25 mph				155 ft			IDOT BDE Manual 31-3.01(a)
30 mph				200 ft			IDOT BDE Manual Fig. 31-3A
40 mph		305 ft		305 ft			IDOT BDE Manual Fig. 31-3A
50 mph		425 ft		425 ft			IDOT BDE Manual Fig. 31-3A
Decision Sight Distance	1445 ft		IDOT BDE Manual Fig. 31-3C				
25 mph				515 ft			AASHTO GDHS, p. 117
30 mph				620 ft			IDOT BDE Manual Fig. 31-3C
40 mph		825 ft		825 ft			IDOT BDE Manual Fig. 31-3C
50 mph		1030 ft		1030 ft			IDOT BDE Manual Fig. 31-3C
HORIZONTAL ELEMENTS							
Superelevation (Maximum)	6%		IDOT BDE Manual Fig. 44-5D	6 %			IDOT BDE Manual 37-4.07(b)
Horizontal Curvature							
Radius	3000 ft (Des.) / 2050 ft (Min.)		IDOT BDE Manual Fig. 44-5D				IDOT BDE Manual Fig. 37-4F
25 mph				185 ft			
30 mph				275 ft			
40 mph		510 ft	IDOT BDE Manual Fig. 32-3C	510 ft			
50 mph		840 ft	IDOT BDE Manual Fig. 32-3C	835 ft			
Length of Curve							
Maximum	1 mile	0.5 mile	IDOT BDE Manual 32-2.06				
Minimum ($\Delta \geq 5°$)	500 ft	200 ft (40 mph), 300 ft (50 mph)	IDOT BDE Manual Fig. 32-2G				
Compound Curves							IDOT BDE Manual Fig. 37-4H
Radius = 150 ft				70 ft (Des.) / 50 ft (Min.)			
Radius = 200 ft				90 ft (Des.) / 60 ft (Min.)			
Radius = 250 ft				120 ft (Des.) / 80 ft (Min.)			
Radius = 300 ft				140 ft (Des.) / 100 ft (Min.)			
Radius = 400 ft				180 ft (Des.) / 120 ft (Min.)			
Radius = 500 ft or greater				200 ft (Des.) / 140 ft (Min.)			
Compound Curve Ratio (Maximum)	1.5:1		IDOT BDE Manual 32-2.01(c)	2:1 for decreasing radii			IDOT BDE Manual 37-4.07(c)
Tangent Between Curves							
Opposite Direction Curves (Minimum)	As required for superelevation; Minimum length of normal crown = 2 sec. of travel time, if used		IDOT BDE Manual 32-3.06	As required for continuous superelevation transition			IDOT BDE Manual 37-4.07(b)
Same Direction Curves (Minimum)	1,500 ft		IDOT BDE Manual 32-2.01(f)	As required for superelevation transitions			
Lane Drop Taper	840 ft (70:1)		IDOT BDE Manual 44-2.06				
Lane Addition Taper	600 ft (50:1)		IDOT BDE Manual 44-2.06				
VERTICAL ELEMENTS							
Mainline Grade							
Maximum (Des. / Abs.)	±3.0% (Des.) / ±4.0% (Abs., restricted conditions)	±4.0% / -6.0%	IDOT BDE Manual Fig. 44-5D, 37-4F				
Minimum (Des. / Abs.)	±0.5% (Des.)	±0.3% (Abs.)	IDOT BDE Manual Fig. 44-5D				
Ramp Grade							IDOT BDE Manual Fig. 37-4F
Maximum				+4.0% / -6.0%			
Minimum (Des./ Abs.)				±0.5% (Des.) / ±0.3% (Min.)			
Intersection Approach Grade				NA	+1.5% - 2.0%, 150 ft - 200 ft min. platform		IDOT BDE Manual 37-5.01
Vertical Curve - Minimum K Values for SSD							
Crest Vertical Curve	247		IDOT BDE Manual Fig. 33-4A				
25 mph				12			AASHTO GDHS, Exh. 3-72
30 mph				19			IDOT BDE Manual Fig. 33-4A
40 mph		44		44			IDOT BDE Manual Fig. 33-4A
50 mph		84		84			IDOT BDE Manual Fig. 33-4A
Sag Vertical Curve	181		IDOT BDE Manual Fig. 33-4E				
25 mph				26			AASHTO GDHS, Exh. 3-75
30 mph				37			IDOT BDE Manual Fig. 33-4E
40 mph		164		64			IDOT BDE Manual Fig. 33-4E
50 mph		96		96			IDOT BDE Manual Fig. 33-4E

Table 1
Preliminary Design Criteria: Mainline and Interchanges - IDOT

Elgin O'Hare - West Bypass
Preliminary Design Criteria: Mainline and Interchanges - IDOT

Criteria	IDOT Mainline	IDOT C-D Road	Reference/Comments	IDOT Interchange Ramps			Reference/Comments
				SYSTEM	SERVICE		
				Directional & Semi-Directional	Diamond & Outer Connection	Loop	
CROSS SECTION ELEMENTS							
Lane Width	12 ft	1-lane: 16 ft Multi-lane: 12 ft	IDOT BDE Manual Fig. 44-5A, IDOT BDE Manual 37-4.02(b)	1-lane: 16 ft, Multi-lane: 12 ft	1-lane: 16 ft, Multi-lane: 12 ft	16 ft	IDOT BDE Manual 37-4.06
Shoulder Width - Right							
Total Width	12 ft	10 ft	IDOT BDE Manual Fig. 44-5A,	10 ft	1-Lane: 8 ft, 2-Lane: 10 ft	8 ft	IDOT BDE Manual 37-4.06,
Paved	12 ft	10 ft	IDOT BDE Manual 37-4.02(b)	10 ft	1-Lane: 6 ft, 2-Lane: 8 ft	6 ft	IDOT BDE Manual Fig. 44-5A
Shoulder Width - Left							
Total Width	12 ft (Min.)	1-Lane: 4 ft, Multi-Lane: 8 ft	IDOT BDE Manual Fig. 44-5A,	1-Lane: 6 ft, 2/3-Lane: 8/10 ft	1-Lane: 6 ft, 2-Lane: 8 ft	6 ft	IDOT BDE Manual 37-4.06,
Paved	12 ft (Min.)	1-Lane: 4 ft, Multi-Lane: 6 ft	IDOT BDE Manual 37-4.02(b)	1-Lane: 4 ft, 2/3-Lane: 6/10 ft	1-Lane: 4 ft, 2-Lane: 6 ft	4 ft	IDOT BDE Manual Fig. 44-5A
Auxiliary Lane Right Shoulder							
Total Width	10 ft		IDOT BDE Manual Fig. 44-5A,				
Paved	10 ft		IDOT BDE Manual 37-4.02(b)				
Horizontal Clearances	30 ft, or as determined by warrants		IDOT BDE Manual 38-3.02				
Cross Slopes			IDOT BDE Manual Fig. 44-5A,				IDOT BDE Manual 37-4.06
Lanes Adjacent to Crown	1.5%			1.5%	1.5%	1.5%	
For 2nd Lane in Same Cross Slope Direction	2.0%			1.5%	1.5%	NA	
For Additional Lanes in Same Cross Slope Direction	2.5%			2.0%	NA	NA	
Shoulders	4.0%			4.0%	4.0%	4.0%	
Rollover (Maximum)							
Between Pavement and Shoulders	8%		IDOT BDE Manual 32-3.04(a)	8%			IDOT BDE Manual 32-3.04(a)
Between Adjacent Pavement Lanes	4%		IDOT BDE Manual Fig. 36-2J	4%			IDOT BDE Manual Fig. 36-2J
Median Width							
Without Transit Corridor in Median	30 ft						
With Transit Corridor in Median	70 ft						
Sideslopes--Fill Section			IDOT BDE Manual 38-3				IDOT BDE Manual 38-3
Foreslopes							
Within Clear Zone	1:6 (Des.) / 1:4 (Max.)			1:6 (Des.) / 1:4 (Max.)			
Outside Clear Zone	1:3 (Des.) / 1:2 (Absolute)			1:3 (Des.) / 1:2 (Absolute)			
Back Slopes	1:3 (Des.) / 1:2 (Absolute)			1:3 (Des.) / 1:2 (Absolute)			
STRUCTURES - IDOT FACILITY OVER							
Construct New Structure Over IDOT Roadway							
Shoulder Width on Structure			IDOT BDE Manual Fig. 39-6A				IDOT BDE Manual Fig. 39-6A
Right Side	12 ft	10 ft		10 ft	1-Lane: 6 ft, 2-Lane: 8 ft	6 ft	
Left Side	12 ft	1-Lane: 4 ft, Multi-Lane: 6 ft		1-Lane: 4 ft, 2-Lane: 6 ft, 3-Lane: 10'		4 ft	
Right Side, Auxiliary Lane	10 ft	10 ft					
Other Roadways	Use Paved Shldr. Widths; See IDOT Local Roads Criteria			Use Paved Shoulder Widths; See IDOT Local Roads Criteria			
Vertical Clearance, Minimum							
IDOT Facilities							
Freeways, Interchanges	16'-9" New, 16'-0" Reconstruction			16'-9" New, 16'-0" Reconstruction			IDOT BDE Manual Fig. 39-6A
Arterials, Marked Hwys. Classified as Collectors	16'-6" New, 16'-0" Reconstruction			16'-6" New, 16'-0" Reconstruction			IDOT BDE Manual Fig. 39-5R
Frontage Road A, ADT > 2000	16'-0"			16'-0"			IDOT BDE Manual Fig. 39-5R
Local Roads and Unmarked Collectors	15'-0"			15'-0"			IDOT BDE Manual Fig. 39-6A
Local Crossroads	14'-9"			14'-9"			IDOT BDE Manual Fig. 39-5R
Railroads	23'-0" (RR Co. may require greater clearance, e.g. 23'-4")			23'-0" (RR company may require greater clearance, such as 23'-4")			IDOT BDE Manual Fig. 39-5S
STRUCTURES - TOLLWAY UNDER							
Retain Existing IDOT Structure Over Tollway			Specific Tollway				
Vertical Clearance	15'-3" (Min.) / No Less Than Existing (Des.)		Direction (I-90)	15'-3" (Min.) / No Less Than Existing (Des.)			Specific Tollway Direction (I-90)
STRUCTURES - TOLLWAY OVER							
Retain Exist. Tollway Structure Over Cross Streets							Refer to I-90 Design Approach
Vertical Clearance				No Less Than Existing			Memo, Finalized June 2007
STRUCTURES - OTHER							
Vertical Clearances Over IDOT Roadway							
Trusses, Overhead Signs, Pedestrian Overpasses	17'-3"		IDOT BDE Manual Fig. 39-6A	17'-3"			IDOT BDE Manual Fig. 39-6A
OPERATIONAL ELEMENTS							
Lane Balance	Applies		IDOT BDE Manual 37-2.03	Applies			IDOT BDE Manual 37-2.03
Lane and Route Continuity	Applies		IDOT BDE Manual 37-2.06	Applies			IDOT BDE Manual 37-2.06
Ramp Spacing (Minimum)		C-D or Frwy. Distribution Rd.:	IDOT BDE Manual Fig. 37-2D				
Entrance - Entrance, end of taper to gore	300 ft	300 ft					
Exit - Exit	1000 ft	800 ft					
Exit - Entrance	500 ft	400 ft					
Entrance-Exit (System to Service)	2000 ft	1600 ft					
Entrance-Exit (Service to Service)	1600 ft	1000 ft					

Table 1
Preliminary Design Criteria: Mainline and Interchanges - IDOT

Elgin O'Hare - West Bypass
Preliminary Design Criteria: Local Roads - IDOT

Criteria	Local Road Design Speed = 50 mph	Reference/Comments	Local Road Design Speed = 45 mph	Reference/Comments	Local Road Design Speed = 30 mph	Reference/Comments
OPERATION						
Level of Service	C	IDOT BDE Figure 47-3C	C (Des.)	IDOT BLRS Figure 32-2C	D	IDOT BLRS Figure 32-2H
On-Street Parking	Not Recommended	IDOT BDE Figure 48-6A	Not Recommended	IDOT BLRS Figure 32-2C	Allowed	IDOT BLRS Figure 32-2H
Design Vehicle at Ramp Intersection	WB-65	IDOT BDE 37-5.01	WB-65	IDOT BDE 37-5.01	WB-65	IDOT BDE 37-5.01
Access Control	Consider Managed Access	IDOT BDE Figure 47-3C	Consider Managed Access	IDOT BDE Chapter 35	Consider Managed Access	IDOT BDE Chapter 35
Sight Distance						
Stopping Sight Distance	425 ft	IDOT BDE Figure 48-6C	360 ft	IDOT BLRS Figure 32-3B	200 ft	IDOT BLRS Figure 32-3C
Decision Sight Distance	890 ft		800 ft	IDOT BDE Figure 48-6C	620 ft	IDOT BDE Figure 48-6C
CROSS SECTION ELEMENTS						
Lane Width		IDOT BDE Figure 47-3C		IDOT BLRS Figure 32-2C		IDOT BLRS Figure 32-2H
Travel Lane	12 ft		12 ft		11 ft (Min.)	
Outside Lane Shared with Bicycles	--		14 ft (Des.) / 13 ft (Min.)		14 ft (Des.) / 13 ft (Min.)	
Turn Lane (1 or 2 lanes)	12 ft		12 ft		11 ft (Des.) / 10 ft (Min.)	
Auxiliary Lane	12 ft		12 ft (Des.) / 10 ft (Min.)		11 ft (Des.) / 10 ft (Min.)	
Parking Lane, including Gutter	--				8 ft (Min.)	
Shoulder Width (for Rural Sections)		IDOT BDE Figure 47-3C		IDOT BLRS Figure 32-2C		IDOT BLRS Figure 32-2B
Right						
Total Width	10 ft		8 ft		2 ft	
Paved	8 ft (Min.)		8 ft		--	
Left, if Present						
Total Width	6 ft		6 ft		--	
Paved	4 ft		4 ft		--	
Auxiliary Lanes	4 ft, paved		4 ft, paved		2 ft	
Outside Curbs (for Urban Sections)						
Curb Type and Width	M-6 Curb	IDOT BDE 34-2.04(c)	B-6.24, B-6.18 or B-6.12 CC&G	IDOT BDE 34-2.04(c)	B-6.24, B-6.18 or B-6.12 CC&G	IDOT BLRS Figure 32-2H
Median Width, if Present						
Rural Design		IDOT BDE Figure 47-3C		IDOT BDE Figure 47-3C		
Depressed	50 ft (Des.) / 44 ft (Min.)				--	
Flush, with Concrete Barrier	22 ft				--	
Urban Design		IDOT BDE Figure 48-6A		IDOT BDE Figure 48-6A		
Flush/TWLTL	11 ft - 13 ft		14 ft	IDOT BLRS Figure 31-1.05(b)	14 ft	IDOT BLRS Figure 32-2F
Traversable TWLTL	16 ft		16 ft		--	
Raised-Curb	18 ft, 22 ft or 30 ft		18 ft, 22 ft or 30 ft	IDOT BDE Figure 48-6A	--	
Cross Slope		IDOT BDE Figure 47-3C				
First 2 Lanes Adjacent to Crown or Median	1.5%		1.5% - 2.0%	IDOT BLRS Figure 32-2C	1.5% - 2.0%	IDOT BLRS Figure 32-2H
Third Lane	2.0%		2.0% - 2.5%	IDOT BLRS Figure 32-2C	2.0% (Min.)	IDOT BLRS Figure 32-2H
Shoulders	4.0%		4.0%	IDOT BDE Figure 47-3C	4% - 6% Agg., 5% - 8% Turf	IDOT BLRS Figure 32-2B
Sidewalk Width						
Rural Design	Varies		Varies			
Behind Curb With Buffer Strip	5 ft	IDOT BDE 48-2.04	5 ft (Des.) / 4 ft (Min.)	IDOT BLRS Figure 32-2C	5 ft (Des.) / 4 ft (Min.)	IDOT BLRS Figure 32-2H
Behind Curb Without Buffer Strip	7 ft		6 ft	IDOT BLRS Figure 31-2.02	6 ft	IDOT BLRS Figure 32-2F
HORIZONTAL ELEMENTS						
Superelevation (Maximum)	6% or 4%	IDOT BDE Figure 32-3A	4%	IDOT BDE Figure 48-5A	4%	IDOT BDE Figure 48-5A
Design Assumption	Open Roadway	IDOT BDE Figure 32-3A	Low-Speed Urban Streets	IDOT BDE Figure 48-5A	Low-Speed	IDOT BDE Figure 48-5A
Horizontal Curvature						
Radius (Minimum)		IDOT BDE Figure 48-6C				
6% Max. Superelevation	835 ft				--	
4% Max. Superelevation	930 ft		665 ft	IDOT BLRS Figure 32-3B	230 ft	IDOT BLRS Figure 32-3C

Table 1
Preliminary Design Criteria: Local Roads

Elgin O'Hare - West Bypass
Preliminary Design Criteria: Local Roads - IDOT

Criteria	Local Road Design Speed = 50 mph	Reference/Comments	Local Road Design Speed = 45 mph	Reference/Comments	Local Road Design Speed = 30 mph	Reference/Comments
VERTICAL ELEMENTS						
Maximum Grade						
Rural Design		IDOT BDE Figure 47-3D				
Level Terrain	6%		--		--	
Rolling Terrain	7%		--		--	
Urban Design		IDOT BDE Figure 48-6C		IDOT BLRS Figure 32-3B		IDOT BLRS Figure 32-3C
Level Terrain	4%		6%		9%	
Rolling Terrain	5%		7%		11%	
Minimum Grade						
With Ditch	0.5% (Des.) / 0.0% (Min.)	IDOT BDE Figure 47-3D	0.5% (Des.) / 0.0% (Min.)	IDOT BLRS Figure 32-3B	0.5% (Des.) / 0.0% (Min.)	IDOT BLRS Figure 32-3A
With Curb and Gutter	0.5% (Des.) / 0.3% (Min.)	IDOT BDE Figure 48-6C	0.5% (Des.) / 0.3% (Min.)	IDOT BLRS Figure 32-3B	0.5% (Des.) / 0.3% (Min.)	IDOT BLRS Figure 32-3C
Intersection Approach Grade, with Vehicle Storage	+1% - +2%, 100 ft min. platform	IDOT BDE 36-1.06(a)	+1% - +2%, 100 ft min. platform	IDOT BDE 36-1.06(a)	+1% - +4%, 50-100 ft min. pltfrm.	IDOT BDE 36-1.06(a)
Vertical Curve - Minimum K Values		IDOT BDE Figure 47-3D		IDOT BLRS Figure 32-3B		IDOT BLRS Figure 32-3C
Crest Vertical Curve	84		61		19	
Sag Vertical Curve	96		79		37	
Rollover (Maximum)						
Between Pavement and Shoulders	8%	IDOT BDE 32-3.04(a)	8%	IDOT BDE 32-3.04(a)	8%	IDOT BDE 32-3.04(a)
Between Adjacent Pavement Lanes	4%	IDOT BDE Figure 36-2J	4%	IDOT BDE Figure 36-2J	5%	IDOT BDE Figure 36-2J
STRUCTURES - LOCAL ROAD OVER						
Local Road Over Tollway						
Retain Existing Structure Over Tollway	15'-3" (Min.) / ≥ Existing (Des.)	Specific Tollway Direction	15'-3" (Min.) / ≥ Existing (Des.)	Specific Tollway Direction	15'-3" (Min.) / ≥ Existing (Des.)	Specific Tollway Direction
Construct New Structure Over Tollway	16'-3"	ISTHA Design Criteria-6C	16'-3"	ISTHA Design Criteria-6C	16'-3"	ISTHA Design Criteria-6C
Local Road Over IDOT Facilities						
Freeways	16'-9" New, 16'-0" Reconstr.	IDOT BDE Figure 39-6A	16'-9" New, 16'-0" Reconstr.	IDOT BDE Figure 39-6A	16'-9" New, 16'-0" Reconstr.	IDOT BDE Figure 39-6A
Arterials; Marked Hwys. Classified as Collectors	16'-6" New, 16'-0" Reconstr.	IDOT BDE Figure 39-5R	16'-6" New, 16'-0" Reconstr.	IDOT BDE Figure 39-5R	16'-6" New, 16'-0" Reconstr.	IDOT BDE Figure 39-5R
Frontage Road A, ADT > 2000	16'-0"	IDOT BDE Figure 39-5R	16'-0"	IDOT BDE Figure 39-5R	16'-0"	IDOT BDE Figure 39-5R
Local Roads and Unmarked Collectors	15'-0"	IDOT BDE Figure 39-6A	15'-0"	IDOT BDE Figure 39-6A	15'-0"	IDOT BDE Figure 39-6A
Local Road over Local Crossroads	14'-9"	IDOT BDE Figure 39-5R	14'-9"	IDOT BDE Figure 39-5R	14'-9"	IDOT BDE Figure 39-5R
Local Road over Railroads	23'-0"	IDOT BDE Figure 39-5S, 39-5T	23'-0"	IDOT BDE Figure 39-5S, 39-5T	23'-0"	IDOT BDE Figure 39-5S, 39-5T
STRUCTURES - LOCAL ROAD UNDER						
Local Road Under Overpassing Structure						
New Overpassing Structure	16'-6"	IDOT BDE Figure 39-5R	See IDOT BDE Fig. 39-5R, 39-6A		See IDOT BDE Fig. 39-5R	
Existing or Reconstructed Overpassing Structure	16'-0"	IDOT BDE Figure 39-5R	See IDOT BDE Fig. 39-5R, 39-6A		See IDOT BDE Fig. 39-5R	

Table 1
Preliminary Design Criteria: Local Roads

Elgin O'Hare - West Bypass
Preliminary Design Criteria: Mainline and Interchanges - ISTHA

Criteria	Tollway Mainline	Tollway C-D Road	Tollway Interchange Ramps			Reference/Comments
			SYSTEM	SERVICE		
			Directional & Semi-Directional	Diamond & Outer Ramps	Loop	
GENERAL ELEMENTS						
Design Speed:	70 mph	60 mph	50 mph	40 mph	30 mph	ISTHA Design Criteria-2
CLASSIFICATION						
Level of Service (Minimum)	D	D	D	D	D	ISTHA Design Criteria-1
Design Vehicle	WB-65	WB-65	WB-65	WB-65	WB-65	ISTHA Introduction C
Sight Distance						
Stopping Sight Distance	850 ft (Des.) / 730 ft (Min.)	650 ft (Des.) / 570 ft (Min.)	475 ft (Des.) / 425 ft (Min.)	325 ft (Des.) / 305 ft (Min.)	200 ft (Des. and Min.)	ISTHA Design Criteria-3A
Decision Sight Distance	1450 (Des.) / 1100 ft (Min.)	1275 ft (Des.) / 1000 ft (Min.)	1025 (Des.) / 750 ft (Min.)	825 ft (Des) / 600 ft (Min.)	625 ft (Des.) / 450 ft (Min.)	ISTHA Design Criteria 3B
HORIZONTAL ELEMENTS						
Horizontal Curvature						
Radius	2,292 ft (Des.) / 2,083 ft (Min.)	1910 ft	765 ft	470 ft	255 ft	ISTHA Design Criteria-4A
Degree of Curve	2°30' (Des.) / 2°45' (Min.)	3°00'				
Length of Curve	1,000 ft (Des.) / 600 ft (Min.)		L = 3 Seconds Travel Distance + 0.3 x (SE Runoff Distance)			ISTHA Design Criteria-4B
Compound Curve Ratio (Maximum)	1.5:1		2:1			ISTHA Design Criteria-4C
Tangent Between Curves						ISTHA Design Criteria-4D
Opposite Direction Curves (Minimum)	As Required for Superelevation		Continuous Transition			
Same Direction Curves (Minimum)	1,500 ft		Continuous Transition			
Superelevation (Maximum)	6%		6 %			ISTHA Design Criteria-4E, IDOT BDE Manual 37-4.07(b)
VERTICAL ELEMENTS						
Mainline Grade						
Maximum (Des. / Abs.)	±3.0%					ISTHA Design Criteria-5A
Minimum (Des. / Abs.)	±0.5% (Des.) / ±0.3% (Abs.)					ISTHA Design Criteria-5B
Ramp Grade						
Maximum (Des. / Abs.)			+3.0% / -4.0% (Des.) / +4.0% / -6.0% (Min.)			ISTHA Design Criteria-5A
Minimum (Des. / Abs.)			±0.5% (Des.) / ±0.3% (Min.)			ISTHA Design Criteria-5B
Intersection Approach Grade	NA		NA	±2%, 100 ft min. platform		ISTHA Design Criteria-5A
Profile Tangent Length (Des. / Min.)	1,000 ft (Des.) / 500 ft (Min.)		NA	NA	NA	ISTHA Design Criteria-5C
Vertical Curve - Minimum K Values						ISTHA Design Criteria-5D
Crest Vertical Curve	540 (Des.) / 247 (Min.)	310 (Des.) / 150 (Min.)	160 (Des.) / 84 (Min.)	80 (Des.) / 44 (Min.)	30	
Sag Vertical Curve	250 (Des.) / 181 (Min.)	160 (Des.) / 136 (Min.)	110 (Des.) / 96 (Min.)	70 (Des.) / 64 (Min.)	40	
CROSS SECTION ELEMENTS						
Mainline						
Pavement Width						ISTHA Design Criteria-7A
3 Lanes	37 ft paved (36 ft striped)					
4 Lanes	49 ft paved (48 ft striped)					
5 Lanes	61 ft paved (60 ft striped)					
6 Lanes	73 ft paved (72 ft striped)					
Auxiliary Lane	12 ft striped					
Shoulder Width - Right						ISTHA Design Criteria-7B
Open Drainage (No Gutter)	12 ft total = 1ft mainline + 11 ft shldr pavement (typical)					
Open Drainage (with Guardrail)	12 ft (typ.)					
Closed Drainage (Type F Barrier or Similar)	12 ft (typ.) + G-3 Gutter					
Closed Drainage (with Wall/Noise Barrier)	12 ft + 5 ft snow storage = 17 ft total, + G-3 Gutter					
Shoulder Width - Left						ISTHA Design Criteria-7B, modified
Open Drainage (Paved)	10 ft					
Closed Drainage (Median Barrier)	12.5 ft					
Horizontal Clearances	30 ft, or as determined by warrants					ISTHA Design Criteria-6B

Table 1
Preliminary Design Criteria: Mainline and Interchanges - ISTHA

Elgin O'Hare - West Bypass
Preliminary Design Criteria: Mainline and Interchanges - ISTHA

Criteria	Tollway Mainline	Tollway C-D Road	Tollway Interchange Ramps			Reference/Comments
			SYSTEM	SERVICE		
			Directional & Semi-Directional	Diamond & Outer Ramps	Loop	
CROSS SECTION ELEMENTS - Continued						
Ramps						
Pavement Width						ISTHA Design Criteria-7A
1 Lane			16 ft	16 ft	18 ft	
2 Lanes			24 ft	24 ft	NA	
3 Lanes			36 ft	---	---	
Shoulders						ISTHA Design Ctieria-7B
Right (Paved)			10 ft	10 ft	10 ft	
Left (Paved)			4 ft	4 ft	4 ft	
With Wall or Noise Barrier			Add 3 ft to width including G-3 Gutter			
Cross Slopes (Mainline & Ramps)						ISTHA Design Criteria-7C
For 2 Lanes	1.5%		1.5%	1.5%	1.5%	
For 3rd Lane in Same Cross Slope Direction	1.5%		1.5%	1.5%	NA	
For Additional Lanes	2.0%		NA	NA	NA	
Shoulders	4.0%		4.0%	4.0%	4.0%	
Rollover (Maximum)						
Between Pavement and Shoulders	7%		7%			ISTHA Design Criteria-4F
Between Adjacent Pavement Lanes	3%		3%			
Median Width	30 ft (minimum)					N/A
Sideslopes--Fill Section						
Foreslopes						
Within Clear Zone	6:1 (Des.) / 4:1 (Max)		6:1 (Des.) / 4:1 (Max)			ISTHA Design Criteria-7D and
Outside Clear Zone	4:1 (Des.) / 2.5:1 (Absolute)		4:1 (Des.) / 2.5:1 (Absolute)			Tollway Maintenance
Back Slopes	4:1 (Des.) / 2.5:1 (Absolute)		4:1 (Des.) / 2.5:1 (Absolute)			
STRUCTURES - TOLLWAY UNDER						
Retain Existing Structure Over Tollway						
Shoulder Width, Minimum						
Right Side	Case By Case					Refer to I-90 Design Approach
Left Side	Case By Case					Memo, Finalized June 2007
Vertical Clearance	15'-3" (Min.) / No Less Than Existing (Des.)					Specific Tollway Direction
Construct New Structure Over Tollway						
Shoulder Width on Tollway						ISTHA Design Criteria-7B
Right Side	12 ft					
Left Side	10 ft (min)					
Vertical Clearance	16'-3"					ISTHA Design Criteria-6C
STRUCTURES - TOLLWAY OVER						
Retain Existing I-90 Structure						
Shoulder Width, Minimum						
Right Side	Case By Case					Refer to I-90 Design Approach
Left Side	Case By Case					Memo, Finalized June 2007
Vertical Clearance	No Less Than Existing					
Widen Existing I-90 Structure						
Shoulder Width						
Right Side (minimum)	12 ft					ISTHA Design Criteria-6A
Left Side (minimum)	10 ft					
Vertical Clearance	No Less Than Existing					Refer to I-90 Design Approach
						Memo, Finalized June 2007

Table 1
Preliminary Design Criteria: Mainline and Interchanges - ISTHA

Elgin O'Hare - West Bypass
Preliminary Design Criteria: Mainline and Interchanges - ISTHA

Criteria	Tollway Mainline	Tollway C-D Road	Tollway Interchange Ramps			Reference/Comments
			SYSTEM	SERVICE		
			Directional & Semi-Directional	Diamond & Outer Ramps	Loop	
STRUCTURES - TOLLWAY OVER - Continued						
Construct New Tollway Structure						
Shoulder Width						ISTHA Design Criteria-6A
Right Side (minimum)	12 ft		10 ft			
Left Side (minimum)	10 ft		6 ft			
Vertical Clearance						
Tollway Facilities	16'-3"		16'-3"			ISTHA Design Criteria-6C
IDOT Facilities						
Freeways	16'-9" New, 16'-0" Reconstruction		16'-9" New, 16'-0" Reconstruction			IDOT BDE Manual Fig. 39-6A
Arterials, Marked Hwys. Classified as Collectors	16'-6" New, 16'-0" Reconstruction		16'-6" New, 16'-0" Reconstruction			IDOT BDE Manual Fig. 39-5R
Frontage Road A, ADT > 2000	16'-0"		16'-0"			IDOT BDE Manual Fig. 39-5R
Local Roads and Unmarked Collectors	15'-0"		15'-0"			IDOT BDE Manual Fig. 39-6A
Local Crossroads	14'-9"		14'-9"			IDOT BDE Manual Fig. 39-5R
Railroads	23'-0" (RR Co. may require greater clearance, e.g. 23'-4")		23'-0" (RR company may require greater clearance, such as 23'-4")			ISTHA Design Criteria-6C
STRUCTURES - OTHER						
Horizontal Clearances						
Sign Truss Supports (behind guardrail)	4 ft (Min.)		4 ft (Min.)			ISTHA Design Criteria-6B
Vertical Clearances						ISTHA Design Criteria-6C
Sign Bridge over Tollway	17'-3"		17'-3"			
Toll Plaza Canopy	17'-3"		17'-3"			
OPERATIONAL ELEMENTS						
Lane Balance	Applies		Applies			AASHTO GDHS, pp. 811-814
Lane and Route Continuity	Applies		Applies			AASHTO GDHS, pp. 807-808
Ramp Spacing (Minimum)						AASHTO GDHS, Exh.10-68
Entrance - Entrance	1000 ft	800 ft				
Exit - Exit	1000 ft	800 ft				
Exit - Entrance	500 ft	400 ft				
Entrance-Exit (System to Service)	2000 ft	1600 ft				
Entrance-Exit (Service to Service)	1600 ft	1000 ft				
Interchange Access Control Requirements						
Spacing from Ramp to Access Point (Minimum)						ISTHA Access Control Requirements, Table 1
Cross Street Design Speed:						
30 mph	450 ft					
40 mph	625 ft					
45 mph	750 ft					
50 mph	900 ft					
55 mph	1050 ft					

Table 1
Preliminary Design Criteria: Mainline and Interchanges - ISTHA