Revised Table 10
Turn Lane Calculations

Site Entrance on Business Route 7 Turn Lane Comparisons

Turn Bay Length Requirements and Recommendations

Queues shown as highest peak hour queues, based on Synchro 7.0 Revised through 6-Aug-09 by PHR+A

Location	Design Speed	Turn Ref.	VDOT Str?	Storage Length (95% Queue)*	Length of Storage (Dec. Length In AASHTO)	Taper	Maximum Length (Storage + Deceleration + Taper)	Minimum Length (AASHTO = Storage + Deceleration); (VDOT= Storage + Taper)	Provided**	Comments Variances from alternative storage lengths based on Storage + Deceleration using taper area for deceleration)
Intersection #4: SCENARIO A WITH VDOR ROAD DESIGN STANDARDS										
Stop Control		*N/S*		*East Colonial US 7*		*E/W*	*Site Entrance*			VDOT ROAD DESIGN MANUAL
Mainline	*E/W*			*Site Entrance*		*Turn Lane Ref:*	*VDOT Road Design Manual*			
EBL	55 MPH	2		100 ft.	200 ft.	200 ft.	500 ft.	300 ft.	510 ft.	Adequate Storage + Taper for Minimum
WBR	55 MPH	2		25 ft.	200 ft.	200 ft.	425 ft.	225 ft.	760 ft.	Bus Dec. Lane + Taper = 410'+190' = 600' > VDOT Minimum 225'
Site Entrance	*N/S*			*East Colonial US 7*						
SBL	25 MPH	2		40 ft.	100 ft.	100 ft.	240 ft.	140 ft.	120 ft.	*Public Street standards not applicable for private entrance*
SBR	25 MPH	2		25 ft.	100 ft.	100 ft.	225 ft.	125 ft.	120 ft.	*Public Street standards not applicable for private entrance*

Intersection #4: SCENARIO B WITH AASHTO GREEN BOOK DESIGN STANDARDS @ 55 MPH, SHOWN FOR REFERENCE ONLY										
Stop Control		*N/S*		*East Colonial US 7*		*E/W*	*Site Entrance*			AASHTO GREEN BOOK DECELERATION
Mainline	*E/W*			*Site Entrance*		*Turn Lane Ref:*	*AASHTO GREEN BOOK DECELERATION*			
EBL	55 MPH	1		100 ft.	485 ft.	180 ft.	765 ft.	585 ft.	510 ft.	Not Adequate Storage + Deceleration @ 55 MPH
WBR	55 MPH	1		25 ft.	485 ft.	180 ft.	690 ft.	510 ft.	760 ft.	Bus Dec. Lane + Taper = 410'+190' = 600' > VDOT Minimum 225'
Site Entrance	*N/S*			*East Colonial US 7*						
SBL	25 MPH	1		40 ft.	ft.	ft.	40 ft.	40 ft.	120 ft.	*AASHTO minimum standard @ 30 MPH N/A*
SBR	25 MPH	1		25 ft.	ft.	ft.	25 ft.	25 ft.	120 ft.	*AASHTO minimum standard @ 30 MPH N/A*

Intersection #4: SCENARIO C WITH AASHTO GREEN BOOK DESIGN STANDARDS @ 50 MPH, SHOWN FOR REFERENCE ONLY										
Stop Control		*N/S*		*East Colonial US 7*		*E/W*	*Site Entrance*			AASHTO GREEN BOOK DECELERATION
Mainline	*E/W*			*Site Entrance*		*Turn Lane Ref:*	*AASHTO GREEN BOOK DECELERATION*			
EBL	50 MPH	1		100 ft.	410 ft.	180 ft.	690 ft.	510 ft.	510 ft.	Adequate Storage + Deceleration @ 45 MPH
WBR	50 MPH	1		25 ft.	410 ft.	180 ft.	615 ft.	435 ft.	760 ft.	Bus Dec. Lane + Taper = 410'+190' = 600' > VDOT Minimum 225'
Site Entrance	*N/S*			*East Colonial US 7*						
SBL	25 MPH	1		40 ft.	ft.	ft.	40 ft.	40 ft.	120 ft.	*AASHTO minimum standard @ 30 MPH N/A*
SBR	25 MPH	1		25 ft.	ft.	ft.	25 ft.	25 ft.	120 ft.	*AASHTO minimum standard @ 30 MPH N/A*

Notes:

Other Intersection legs not included. Designs approved as part of previous designs.
Storage analysis and conformity with VDOT standards by PHR+A.
* ft. = stacking reported in Snychro, See Exhibit 5C for output on queues.

**Taper included in Deceleration Length.

Turn Ref: (1) AASHTO Green Book (2) VDOT Road Design Man. Fig. C-1-1 (3) VDOT Northern Virginia District Guidelines, 1985 app.

VDOT Storage? "X" if 95% queue is less than Figure c-1-1.1.

Legend	*Turn lane area deficient from storage + deceleration (including Taper)*
MPH	= Speed Limit not shown for throughs, default no dec.+taper required

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