Traffic Light System (Lab 10) by Addison Sears-Collins

Inputs (3 bits; i.e. 8 input combos)				
Port	Name	Nickname	1	0
PE2	Walk sensor	walk_sensor	pedestrians present	no pedestrians
PE1	North/south sensor	nrthsth_sensor	cars on northsth	no cars on northsth
PE0	East/west sensor	estwst_sensor	cars on estwst	no cars on estwst

Outputs (8 bits)				
Port	Name	Nickname	1	0
PB5	East/west red	estwst_red	on	off
PB4	East/west yellow	estwst_yellow	on	off
PB3	East/west green	estwst_green	on	off
PB2	North/south red	nrthsth_red	on	off
PB1	North/south yellow	nrthsth_yellow	on	off
PB0	North/south green	nrthsth_green	on	off
PF3	Walk	do_walk	on	off
PF1	Don't walk	dont_walk	on	off

*Next State is the interior of the table

Current State					Input (PE2.PE1.PE0)							
					no pedestrians no cars on northsth no cars on estwst	no pedestrians no cars on northsth cars on estwst	no pedestrians cars on northsth no cars on estwst	no pedestrians cars on northsth cars on estwst	pedestrians present no cars on northsth no cars on estwst	pedestrians present no cars on northsth cars on estwst	pedestrians present cars on northsth no cars on estwst	pedestrians present cars on northsth cars on estwst
Num	Name	Traffic Light Output PB5-0	Walk Light Output PF3.PF1	Time (ms)	000	001	010	011	100	101	110	111
0	GoNS	100001	0010	900	GoNS	SlowNS	GoNS	SlowNS	SlowNS	SlowNS	SlowNS	SlowNS
1	SlowNS	100010	0010	900	GoEW	GoEW	GoEW	GoEW	DoWalk	GoEW	DoWalk	GoEW
2	GoEW	001100	0010	900	GoEW	GoEW	SlowEW	SlowEW	SlowEW	SlowEW	SlowEW	SlowEW
3	SlowEW	010100	0010	900	DoWalk	DoWalk	GoNS	GoNS	DoWalk	DoWalk	DoWalk	DoWalk
4	DoWalk	100100	1000	900	DoWalk	HurryUp1	HurryUp1	HurryUp1	DoWalk	HurryUp1	HurryUp1	HurryUp1
5	HurryUp1	100100	0010	900	HurryUp2	HurryUp2	HurryUp2	HurryUp2	HurryUp2	HurryUp2	HurryUp2	HurryUp2
6	HurryUp2	100100	0000	900	HurryUp3	HurryUp3	HurryUp3	HurryUp3	HurryUp3	HurryUp3	HurryUp3	HurryUp3
7	HurryUp3	100100	0010	900	HurryUp4	HurryUp4	HurryUp4	HurryUp4	HurryUp4	HurryUp4	HurryUp4	HurryUp4
8	HurryUp4	100100	0000	900	HurryUp5	HurryUp5	HurryUp5	HurryUp5	HurryUp5	HurryUp5	HurryUp5	HurryUp5
9	HurryUp5	100100	0010	900	GoNS	GoEW	GoNS	GoNS	GoNS	GoEW	GoNS	GoNS

*In Hurry Up, I will flash the Don't Walk Light if sensors sense traffic on either N/S or E/W road or both
N/S yields tiebreak to between E/W and Pedestrian to E/W
E/W yields tiebreak between N/S and Pedestrian to Pedestrian
N/S has priority over E/W traffic
"Slow" mean that the light is turning yellow (i.e. we are in a transition state)

Current State						
Num	Name	Traffic Light Output PB5-0	In hex	Walk Light Output PF3.PF1	In hex	Time (ms)
0	GoNS	100001	0x21	0010	0x02	900
1	SlowNS	100010	0x22	0010	0x02	900
2	GoEW	001100	0xC	0010	0x02	900
3	SlowEW	010100	0x14	0010	0x02	900
4	DoWalk	100100	0x24	1000	0x08	900
5	HurryUp1	100100	0x24	0010	0x02	900
6	HurryUp2	100100	0x24	0000	0x00	900
7	HurryUp3	100100	0x24	0010	0x02	900
8	HurryUp4	100100	0x24	0000	0x00	900
9	HurryUp5	100100	0x24	0010	0x02	900