

Traffic Signal Handbook

Location of Signal Faces:

There shall be a minimum of two vehicular signals, for the through movement, visible to the driver, when stopped at the stop line. These two signals, or additional signals, shall be visible to traffic on the approach.

When the left or right turning movement is terminated at a time other than the through movement for that approach a separate signal face shall be displayed for that movement in addition to the two (2) signal faces for the through movement and a sign "Left or Right Turn Signal" (R 18-2 L or R 18-2 R) shall be located close to that signal.

When the left or right turn movement is followed by the Circular Green, the left or right green arrow may be displayed with the approach signal. The left arrow with the signal to the left, the right arrow with the signal to the right of that approach.

Position of Lenses:

Each vehicular signal face shall have at least three lenses:

Lenses in a Vertical line shall have the Red on top, Yellow immediately below and the Green at the bottom.

Lenses in a Horizontal line shall have the Red at the left, Yellow next and the Green at the right.

Position of Arrow Lenses:

Arrow lenses in a Vertical line, the straight through shall be below the circular green, if any, the left-turn arrow next, and the right turn arrow at the bottom.

Arrow lenses in a Horizontal line, the left-turn arrow to the immediate right of the yellow, the circular green, if used, next, followed by the straight through and the right-turn arrow, respectively.

Inverted "T" Mounting

Combinations of a circular green lens with a green arrow lens, or combination of two green arrow lenses may be mounted horizontally below the vertical aligned red and yellow lenses as follows:

Left Approach Signal

Left-turn green arrow with circular green to the right.

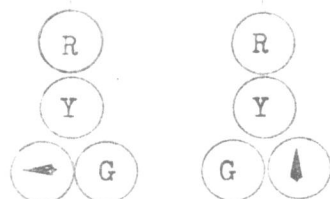
Straight-through green arrow with circular green to the left.

Right Approach Signal

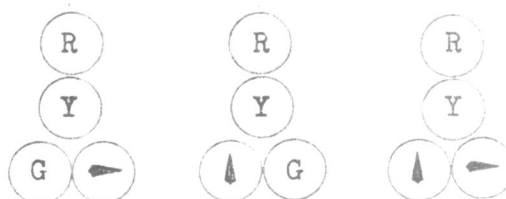
Right-turn green arrow with circular green to the left.

Straight-through green arrow with circular green or right-turn green arrow to the right.

Left Approach Signal



Right Approach Signal



Twelve Inch (12") Lense

The 12" lense provides an important increase in the target value of the signal at locations where signal indications tend to be overlooked, such as:

- (1) Rural intersections, or those with high approach speeds.
- (2) Isolated intersections or those where signalization might be unexpected.

(3) Special problem locations.

(4) Where arrows are used.

Approach signals shall be preferred over lane signals. The minimum horizontal distance between signal faces for the same approach shall be 8 feet. (see attached sketches).

The Color and Arrow Indications in traffic control signals shall have the following meaning:

STEADY RED:

Vehicular traffic facing the signal shall stop before entering the crosswalk on the near side of the intersection, or, if none, then before entering the intersection and shall remain standing until the green indication is shown.

A pedestrian facing such signal shall not enter the roadway unless he can do so safely and without interfering with any vehicular traffic, or unless a separate walk indication is shown.

STEADY YELLOW:

Vehicular traffic facing the signal is thereby warned that the red indication will be exhibited thereafter or that the related green movement is being terminated.

Unless otherwise directed by a pedestrian signal, pedestrians facing such signal are thereby advised that there is insufficient time to cross the roadway.

The yellow signal shall not be shown simultaneously with the green or red indication. Green arrows may be shown together with steady yellow when movements other than those indicated by the green arrows are being stopped.

STEADY CIRCULAR GREEN (Alone):

Vehicular traffic facing the signal may proceed straight through or turn right or left unless a sign, reflectorized or preferably illuminated, at such place prohibits any of those movements.

Pedestrians facing such signal may proceed across the roadway within any marked or unmarked crosswalk unless directed otherwise by a pedestrian signal.

GREEN ARROW:

The green arrow shall be reserved to indicate those vehicular movement(s) which are protected by the delay or restriction of opposing or conflicting vehicular movement(s) across or into the path of that vehicular movement indicated by the green arrow.

Traffic directed by a steady circular green, a green arrow, or combination of circular green or green arrow or combination of green arrows, shall yield the right-of-way to pedestrians within the intersection or adjacent crosswalk and to vehicles lawfully within the intersection at the time such signal is exhibited.

STRAIGHT-THROUGH GREEN ARROW (Alone):

Vehicular traffic facing the signal may proceed through, but shall not turn right or left unless another arrow is present and illuminated.

Pedestrians facing the signal may proceed across the roadway within the appropriate marked or unmarked crosswalk unless directed otherwise by a pedestrian signal.

Straight-through green arrow may be shown along, with another arrow, with steady yellow (When preceded by circular green or other arrow) but never with a circular steady red.

LEFT TURN GREEN ARROW:

Vehicular traffic facing a left turn green arrow may proceed to the left, but shall not turn right or go straight through unless another arrow or circular green is present and illuminated.

No pedestrian facing such a signal shall enter the roadway unless he can do so safely and without interfering with any vehicular traffic.

Left turn green arrow shall be shown with a steady red when through movements are stopped on that approach.

Left turn green arrow may be shown alone over an exclusive left turn

lane, either so designed or signed, when accompanied by through movements on that approach.

Left turn green arrow may be used with circular green, another arrow, steady yellow, or steady red.

RIGHT TURN GREEN ARROW:

Vehicular traffic facing a right turn green arrow may proceed to the right but shall not turn left or go straight through unless another arrow or circular green is present and illuminated.

No pedestrian facing such a signal shall enter the roadway unless he can do so safely and without interfering with any vehicular traffic.

Right turn green arrow may be used with a steady red, steady yellow or another arrow. It should not be used with a circular green. Its use with a steady red should be limited to intersections where the cartway into which the turn is permitted is sufficient in width to accept the turn and any other movement permitted into that cartway at that time without conflict.

No circular green, green arrow, or flashing yellow shall be terminated and immediately followed by a steady red without the display of a steady yellow clearance interval.

Steady yellow shall not be used in transition from steady red or flashing red to circular green, green arrow, or flashing yellow.

Transition may be made directly from circular green, green arrow, steady red, flashing red, or steady yellow to flashing yellow.

PEDESTRIAN SIGNALS:

Pedestrian signals shall be rectangular or square in shape and shall contain the lettered message "Don't Walk" on the top, and "Walk" on the bottom. The "Don't Walk" shall be Portland Orange and the "Walk" shall be Lunar White in color.

Flashing "Don't Walk" shall be preferred for the pedestrian clearance period.

A FLASHING SIGNAL is a traffic signal (red-yellow-green) which operates as stop and go during all or part of the day. When not operating as stop and go it shall flash red on the minor street(s) and yellow on the major street.

A FLASHING BEACON is a section of a traffic signal head or a similar type device having a yellow or red lens.

The operation and meaning of Flashing Signals and Flashing Beacons are similar in that the illuminating element shall be flashed continuously at a rate not less than 50 nor more than 60 pulsations per minute. The illuminated period of each flash shall not be less than half and not more than two-thirds of the total flash cycle.

FLASHING RED (STOP SIGNAL):

When a red lens is illuminated by intermittent flashes, drivers of vehicles shall stop before entering intersection, and the right to proceed shall be subject to the rules applicable after making a stop at a stop sign.

Stop signs shall not be used at Flashing Signals (red) but may be used at Flashing Beacons (red).

FLASHING YELLOW (CAUTION SIGNAL):

When yellow is illuminated with intermittent flashes, drivers of vehicles may proceed through the intersection or past such signal with more than ordinary caution.

Steady yellow shall not be used as a caution signal.

TRAFFIC SIGNALS shall operate continuously either FLASHING or as "Stop and Go".

In Flashing Beacons the red shall operate continuously while the yellow may operate continuously or only during those hours when hazard or need for caution exists.

A flashing red beacon may be used with a steady right turn green arrow, to emphasize the condition "Stop, - Right Turn Keep Moving".

A steady red beacon may be used with a steady right turn green arrow. When displayed it shall be interpreted as "Stop, - Do Not Enter - Right Turn Only".

When a stop and go signal reverts or changes to flashing operation, the change shall take place at the beginning of Main Street green and return from Flashing operation to stop and go shall take place at or near the beginning of Main Street green to assure maximum green on Main Street before transfer of right-of-way to the side street.

Signals shall not be used as Signs. Therefore, the use of arrow lenses should be avoided to indicate one-way street systems.

Each signal face shall be so adjusted that its beam will be of maximum effectiveness to the approaching traffic for which it is intended. Visors, louvers, and back-plates shall be used to assure effectiveness, when physical conditions indicate improved visibility by their use.

VISOR:

Visors are necessary to shade the signal lenses from the sun, sky and other conditions which tend to make a lens look illuminated when it is not, or to shield the lens from motorists on other approaches who might be confused were they to see the lens.

There are three types: Standard visors, tunnel visors, and full circle visors.

LOUVERS:

Louvers are used to decrease the possibility of motorists seeing signals which are not intended for them, especially at intersections where roads come together at acute angles.

BACKPLATES:

Improve the visibility of signals otherwise impaired by background lighting, sun light, or glare behind the signal face.

TRAFFIC SIGNALS NEAR GRADE CROSSINGS:

At some street and highway intersections, railroad tracks pass within or near the intersection area, and at such intersections, it is essential that the control of the vehicular traffic signal be pre-empted by the train approach signal, or by some other means, to avoid conflicting aspects of traffic signal and train approach signal, and insure clearance of the tracks by all vehicular traffic.

Train approach signals come under the jurisdiction of the Public Utility Commission at Harrisburg, Pennsylvania, and any application or request for such controls must be presented to the Commission.

In view of the Public Utility Commission's jurisdiction over train approach signals, all vehicular traffic signals to be located within 300 feet of a railroad grade crossing must be reviewed by the Commission before a permit for vehicular traffic signals may be issued by the Secretary of Highways.

August 4, 1966

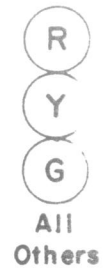
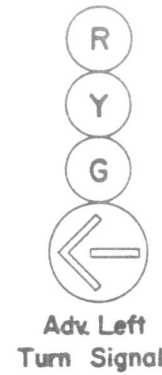
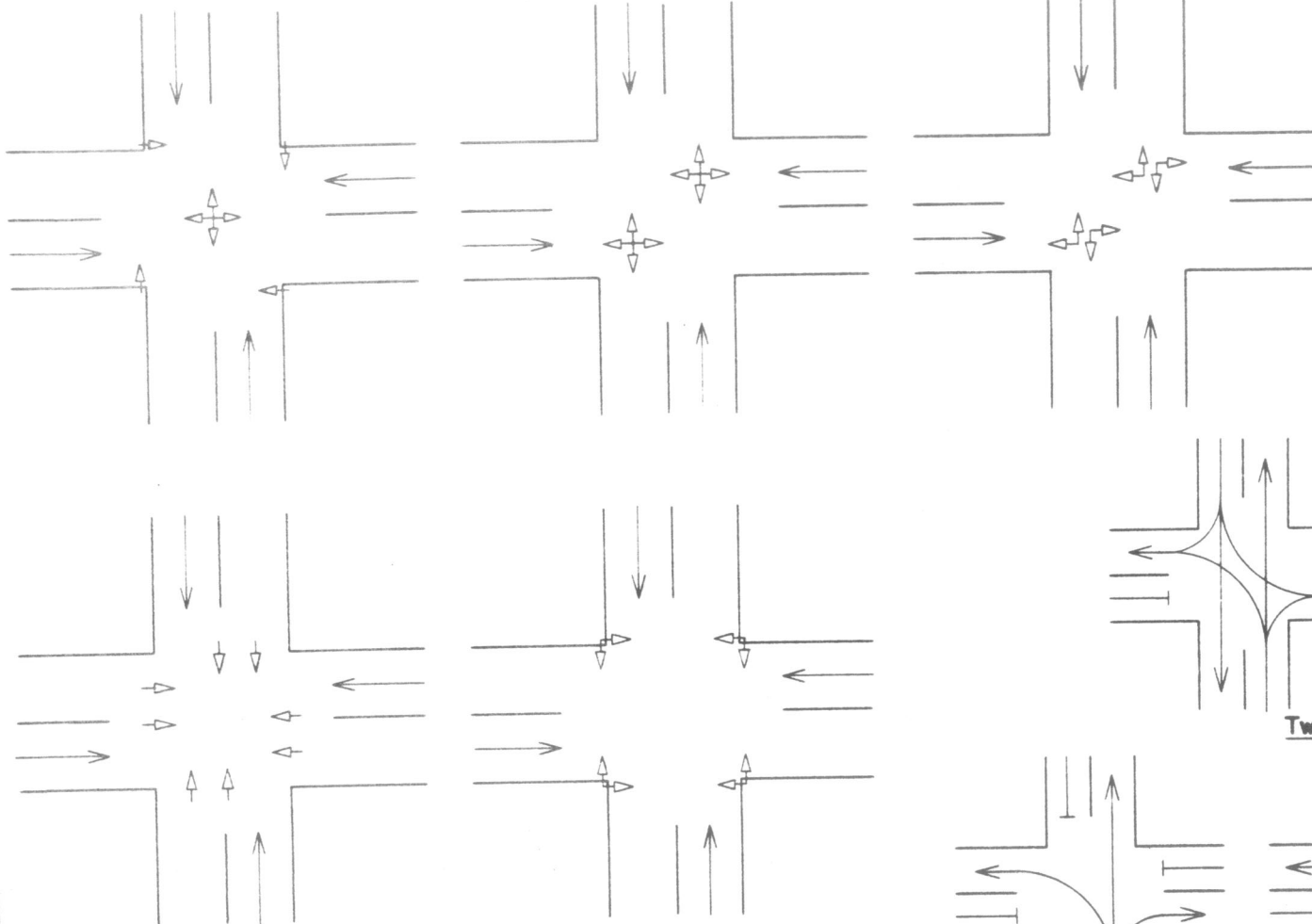
Revised August 16, 1966

Revised February 20, 1967

Intersection of Two, Two Way, 10 Lane Streets

Showing Minimum Vehicular Signals only; Pedestrian movement may require Additional Signals

Acceptable Signal Placement



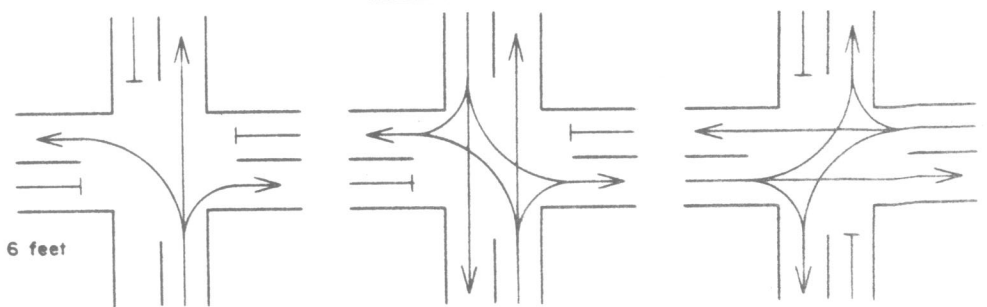
Arrow lens should be 12",
all others may be 8" or 12".

Left signal when suspended shall be in center of highway or left of center. It should not be more than 6 feet to the left of center.

Minimum horizontal distance between suspended signals on any approach shall be 8 feet, measured at right angles to the direction of the approach.

When indicating Advance Left Turn protection the arrow shall be in Left signal only.

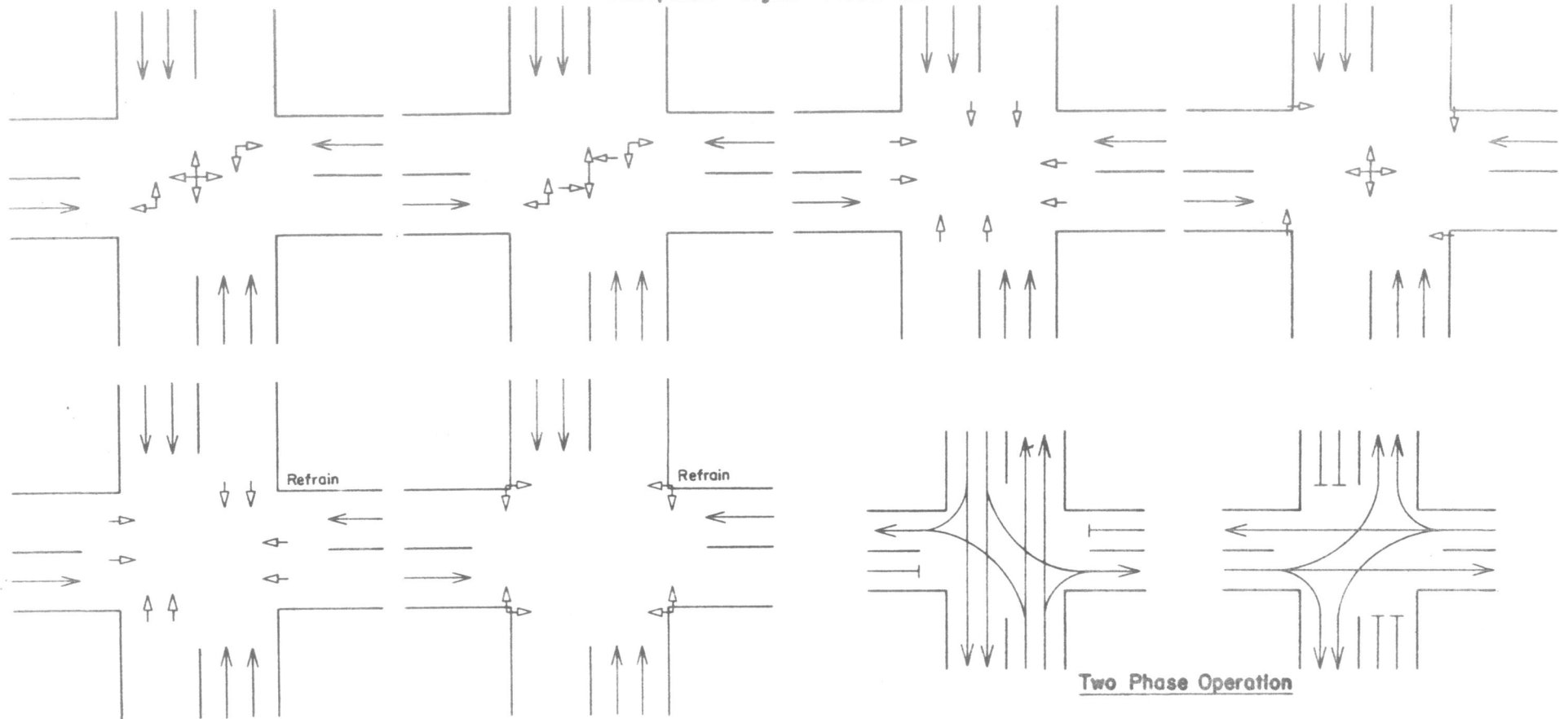
Two Phase Operation



Two Phase with Advance Green on One Phase

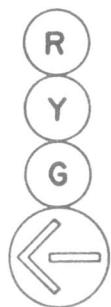
Intersection of One, Two Way, Two Lane Street, and a Two Way, Four Lane Street
 Showing Minimum Vehicular Signals only; Pedestrian movement may require Additional Signals

Acceptable Signal Placement



Two Phase Operation

Arrow placement see notes on
 Sheet 1.

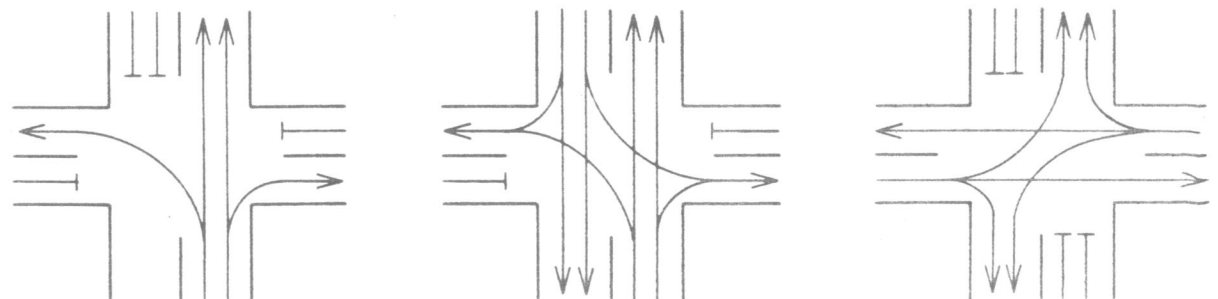


Adv. Left
 Turn Signal



Arrow lens should be 12",
 all others may be 8" or 12".

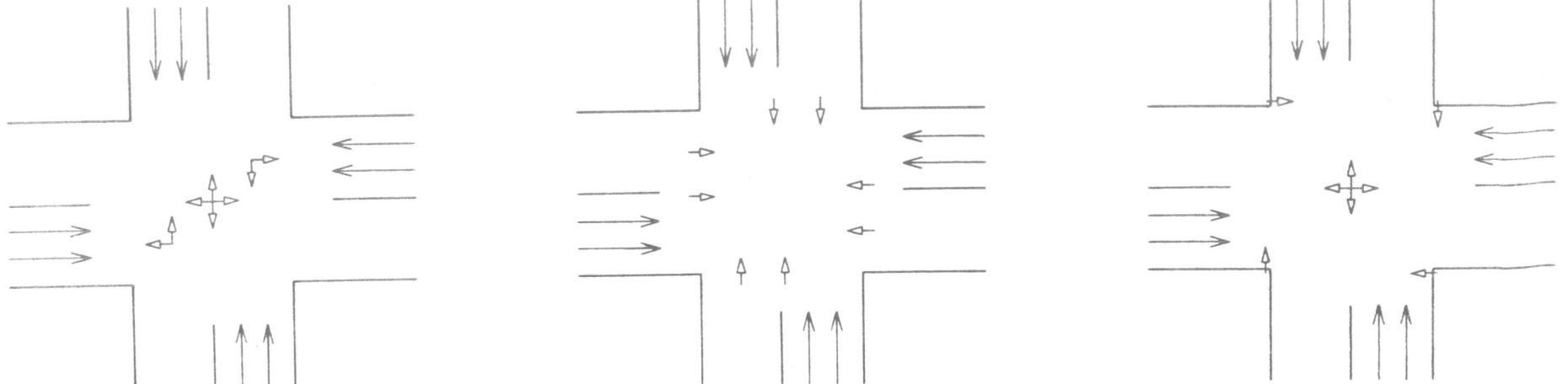
Two Phase with Advance Green on One Phase



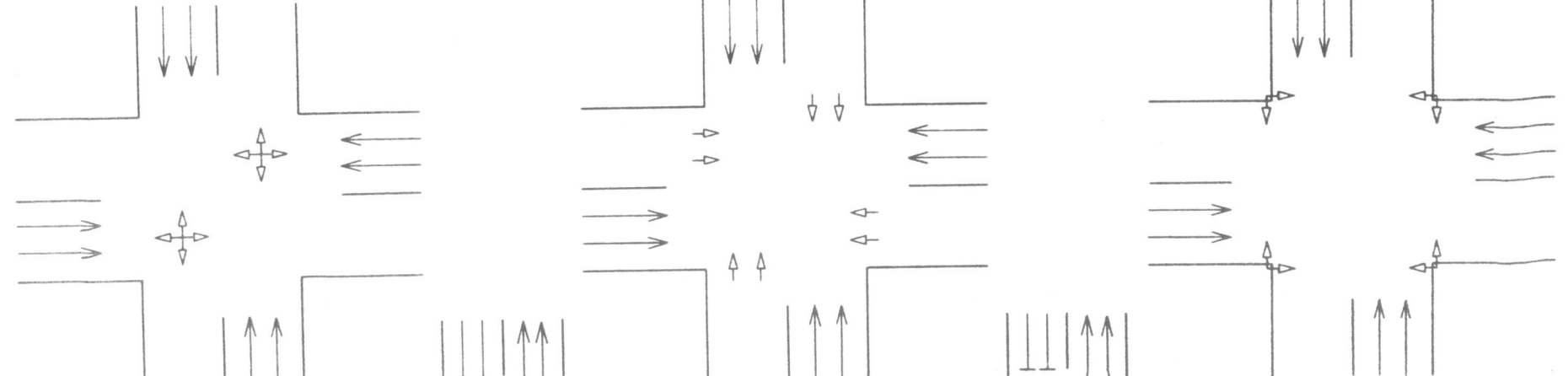
Intersection of Two, Two Way, Four Lane Streets

Showing Minimum Vehicular Signals only; Pedestrian movement may require Additional Signals

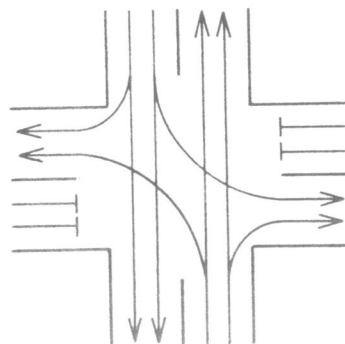
Acceptable Signal Placement



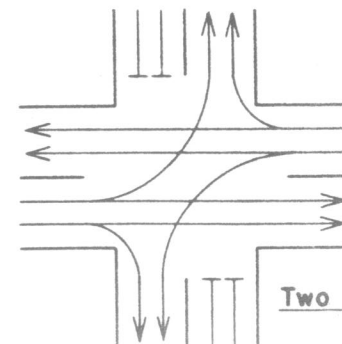
Acceptable But Not Recommended Placement



Arrow Placement and Detail see notes on sheet 2.



Two Phase Operation



Two Phase with Advance Green on One Phase

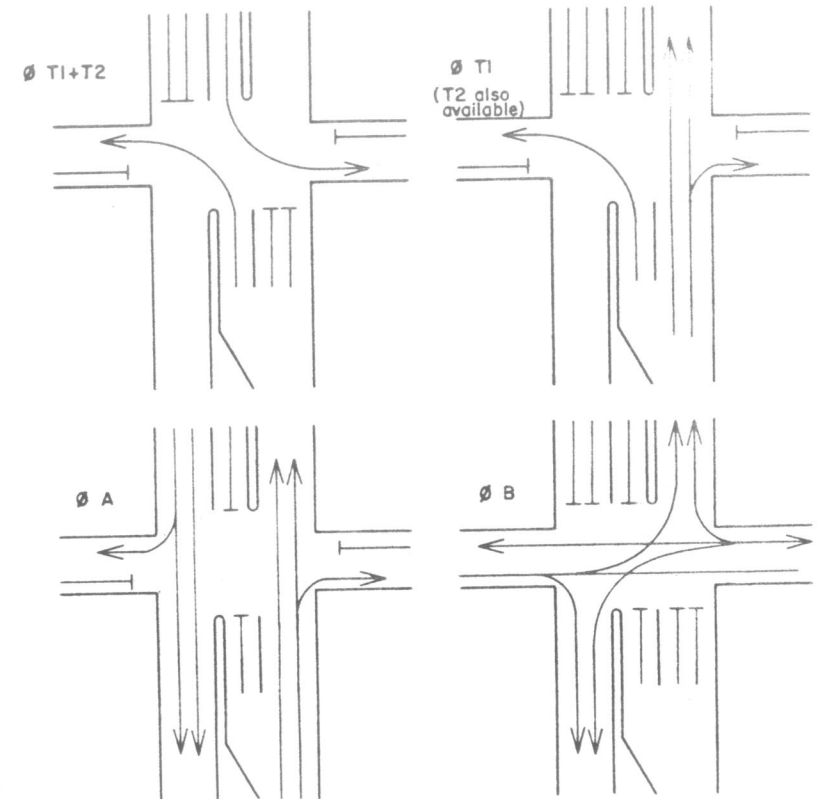
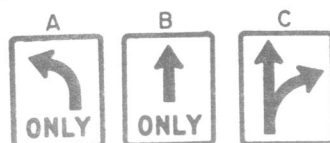
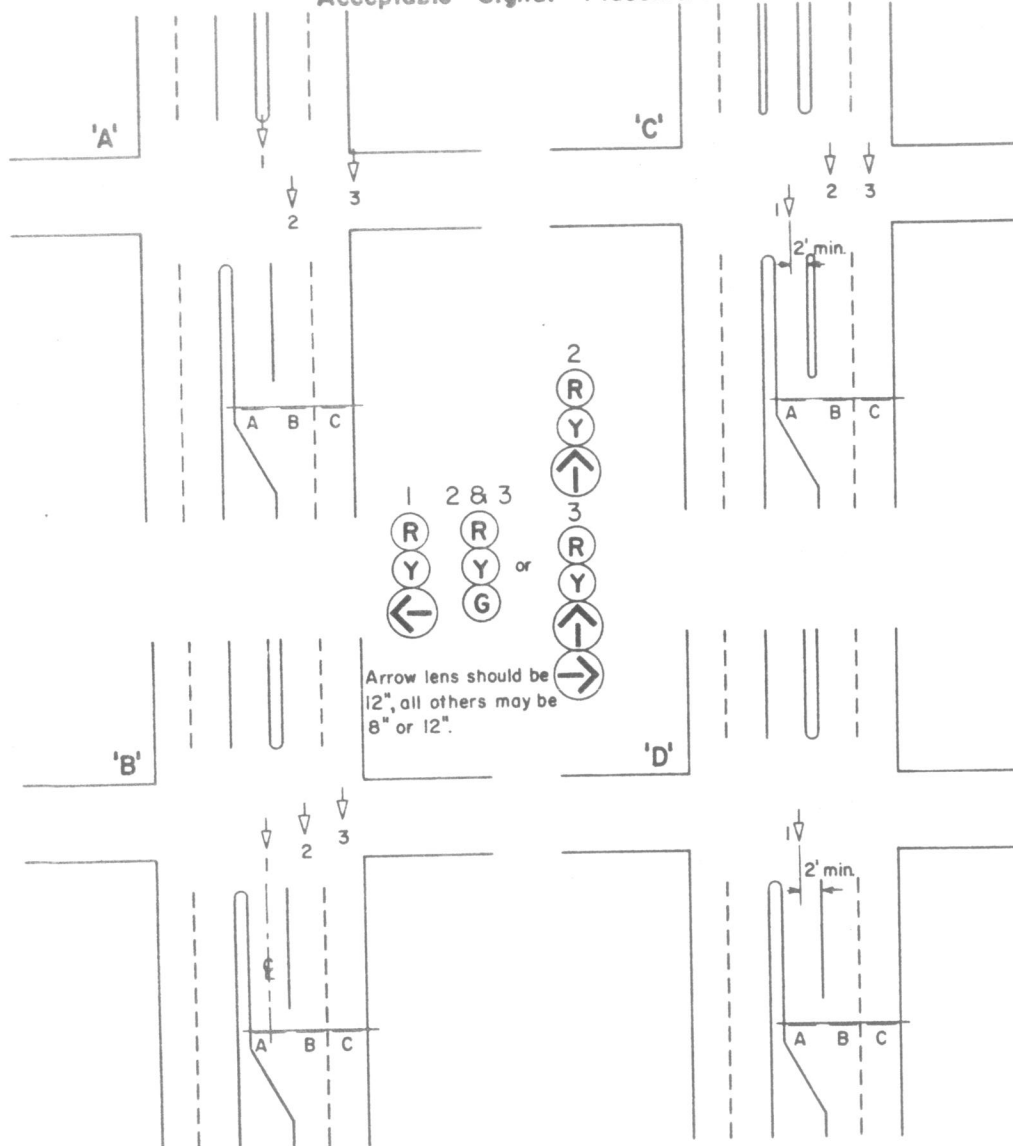
See sheet 2 for 4 lane.

sheet 1 for 2 lane.

Left Turn Stand by Lanes

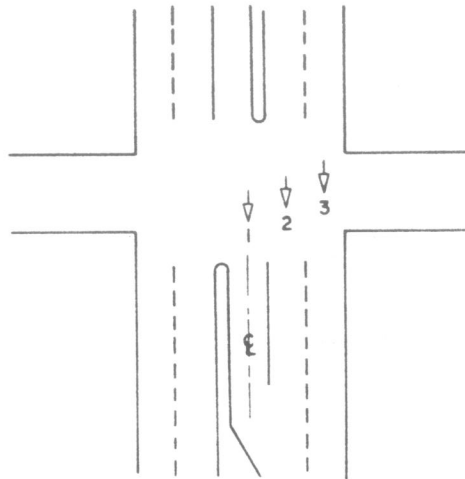
Showing Minimum Vehicular Signals only; Pedestrian movement may require Additional Signals

Acceptable Signal Placement



Movement Diagram

Signal 2 & 3 may show circular green or green arrows if opposing left turn lane is present and signalized for protected movement.
Signal 2 & 3 shall show circular green only if opposing left turn is not signalized for protected movement.
Near Side Island Signal Auxiliary only, signal 1 of any sketch may be used with 2 & 3 of other sketches.
See sheet 4a for color sequence.



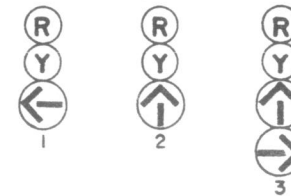
Movement diagram see sheet 4

Signals



	T1+T2		T1		A		B	
1	R	R	←	Y	R	R	R	R
2	R	R	G	G	G	Y	R	R
3	R	R	G	G	G	Y	R	R
Opposing Lt. Turn	R	←	Y	R	R	R	R	R
Opposing Thru. & Rt.	R	R	R	R	G	Y	R	R
Side Street	R	R	R	R	R	R	G	Y

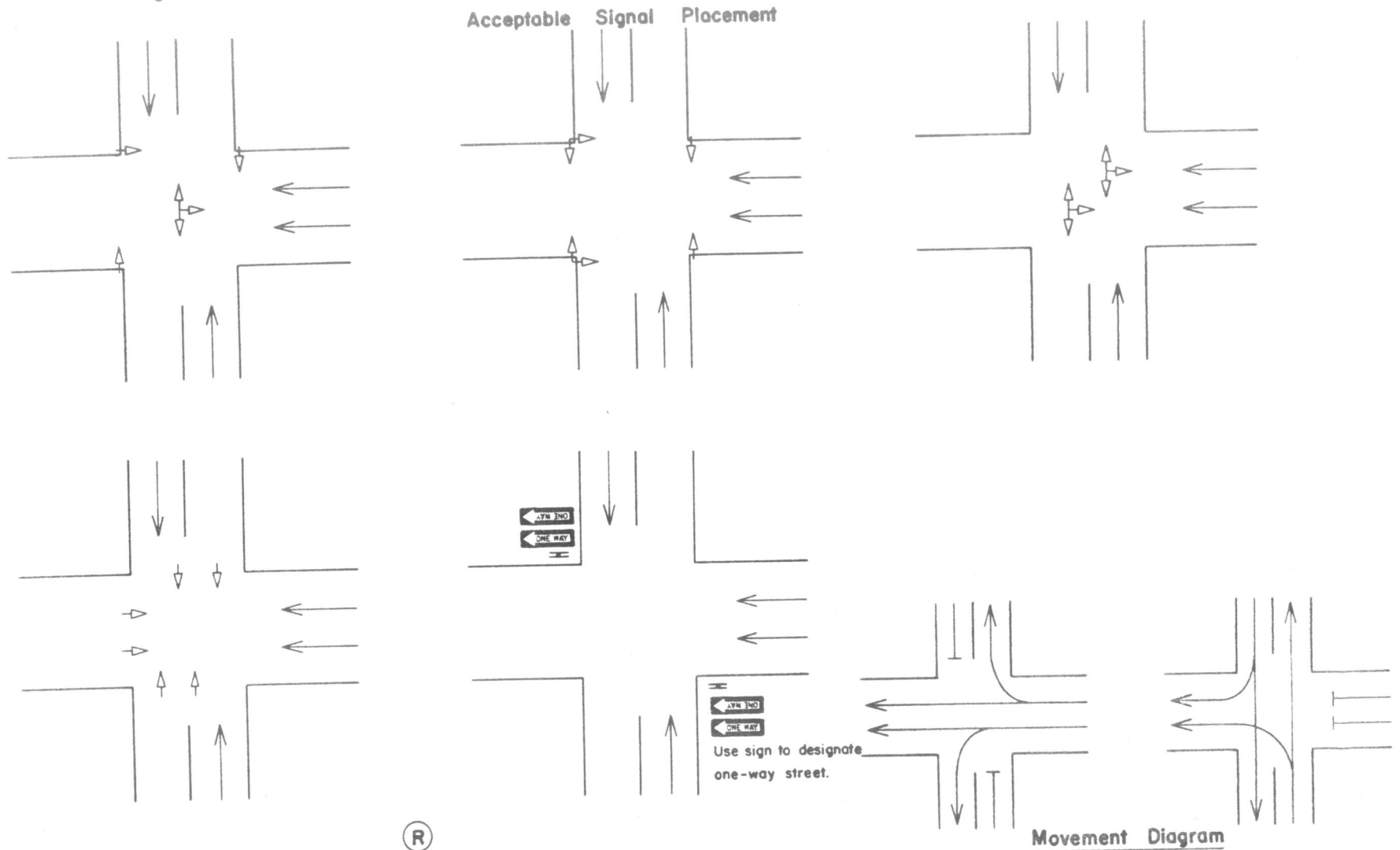
Signals



	T1+T2		T1		A		B	
1	R	R	←	Y	R	R	R	R
2	R	R	↑	↑	↑	Y	R	R
3	R	R	↗	↗	↗	Y	R	R
Opposing Lt. Turn	R	←	Y	R	R	R	R	R
Opposing Thru. & Rt.	R	R	R	R	↗	Y	R	R
Side Street	R	R	R	R	R	R	G	Y

A One Way Street Intersecting a Two Way Street

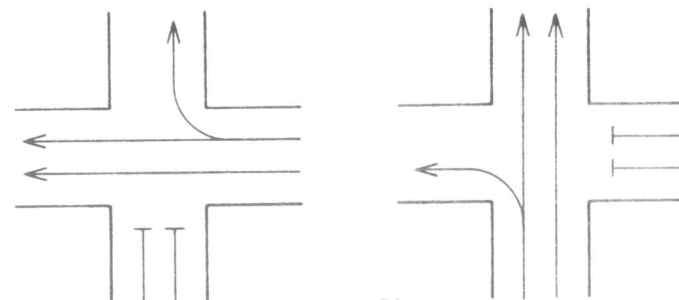
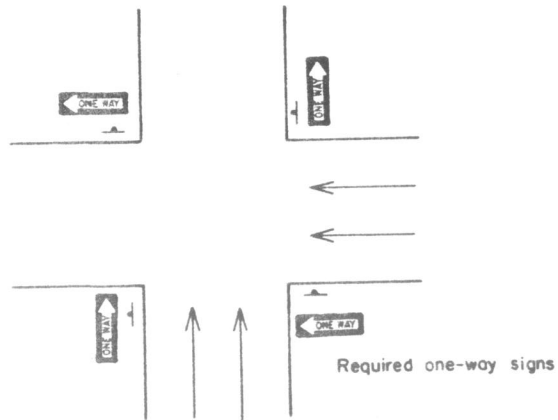
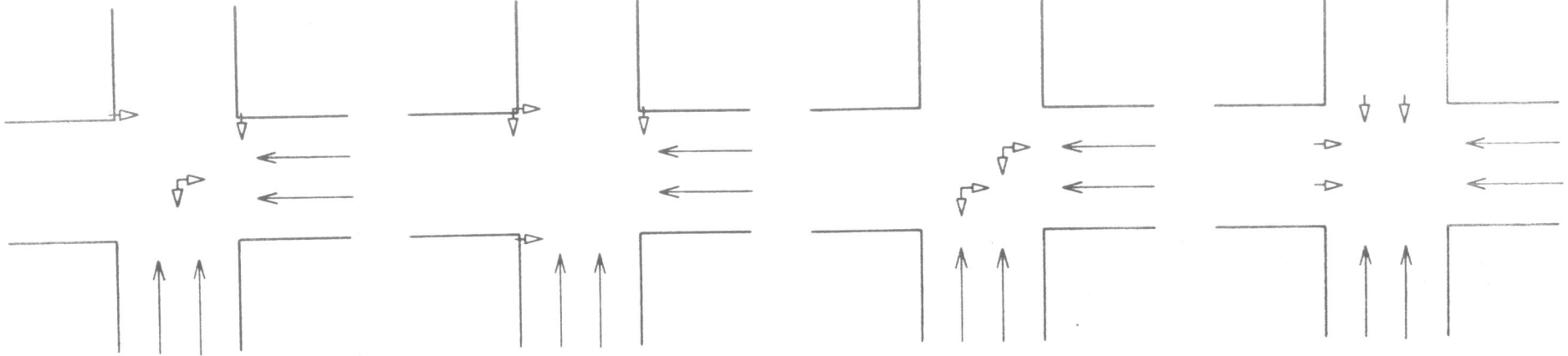
Showing Minimum Vehicular Signals only; Pedestrian movement may require Additional Signals



Intersection of Two One Way Streets

Showing Minimum Vehicular Signals only; Pedestrian movement may require Additional Signals

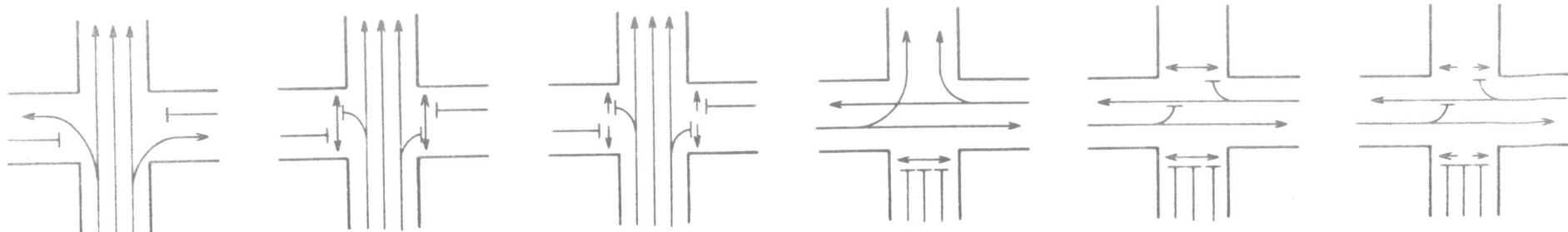
Acceptable Signal Placement



Movement Diagram

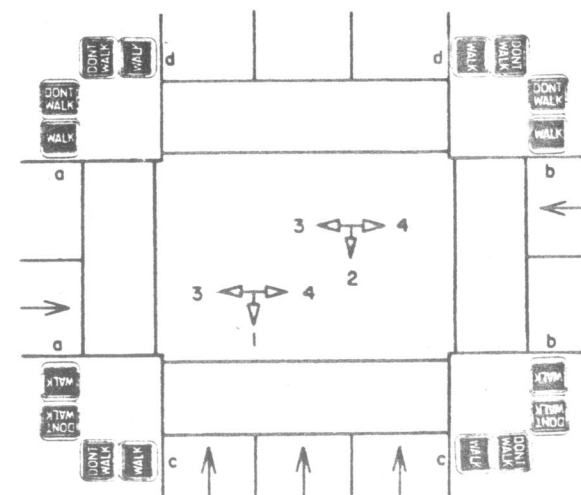
R
Y
G
All
Signals

Split Phase, Walk-Don't Walk One Way Street Intersecting a Two Way Street



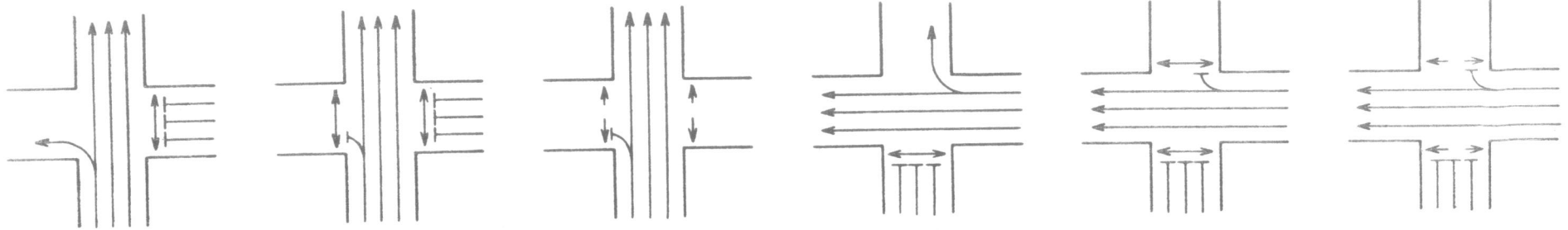
Signal											
1 - 2	G	Y	↓	↓	Y	R	R	R	R	R	
3	R	R	R	R	R	G	Y	↓	↓	Y	
4	R	R	R	R	R	G	Y	↓	↓	Y	
a	D	W	D	W	W	Fl	DW	Fl	DW	D	W
b	D	W	D	W	W	Fl	DW	Fl	DW	D	W
c	D	W	D	W	W	D	D	W	W	Fl	DW
d	D	W	D	W	W	D	D	W	W	Fl	DW
Time	18	3	6	7.5	3	18	3	6	7.5	3	75
%	24	4	8	10	4	24	4	8	10	4	100
Dial Set	24	28	36	46	50	74	78	86	96	0	

Signals

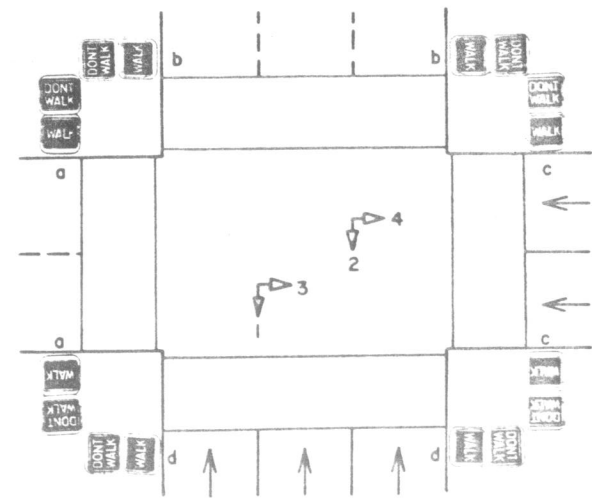
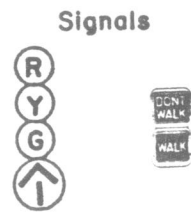


Use signs to designate one-way streets.
See sheet 5.

Split Phase, Walk-Don't Walk Intersection of Two, One Way Streets



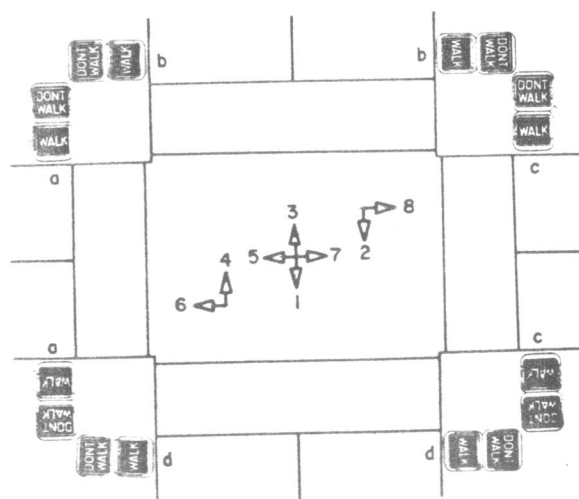
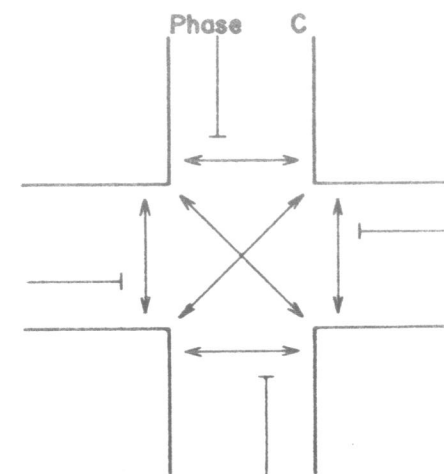
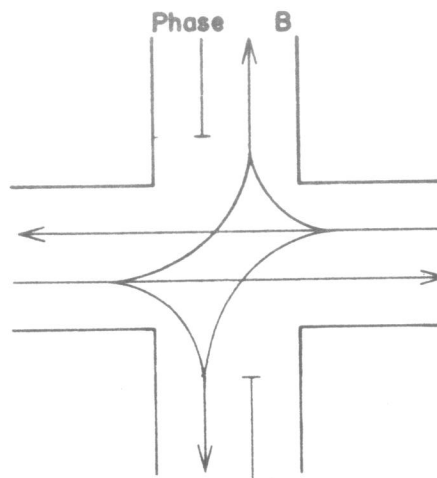
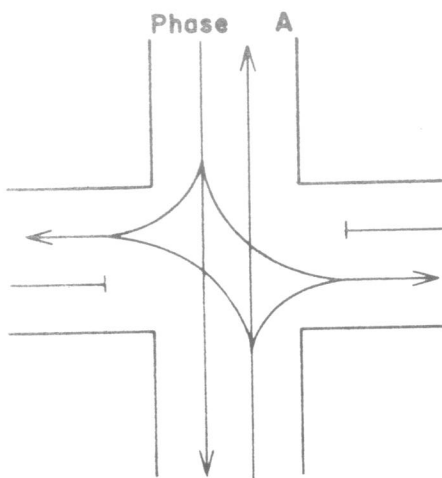
Signals											
1-2	G	Y	↓	↓	Y	R	R	R	R	R	
3-4	R	R	R	R	R	G	Y	↓	↓	Y	
a	D	W	D	W	W	FL	DW	FL	DW	D	W
b	D	W	D	W	D	W	D	W	D	W	W
c	W	W	W	W	FL	DW	FL	DW	D	W	W
d	D	W	D	W	D	W	W	W	W	FL	DW
Time	18	3	6	7.5	3	18	3	6	7.5	3	75
% Cycle	24	4	8	10	4	24	4	8	10	4	100
Dial Set	0	24	28	36	46	50	74	78	86	96	0



Use signs to designate one-way streets.
See sheet 6.

Exclusive Walk-Don't Walk Phase

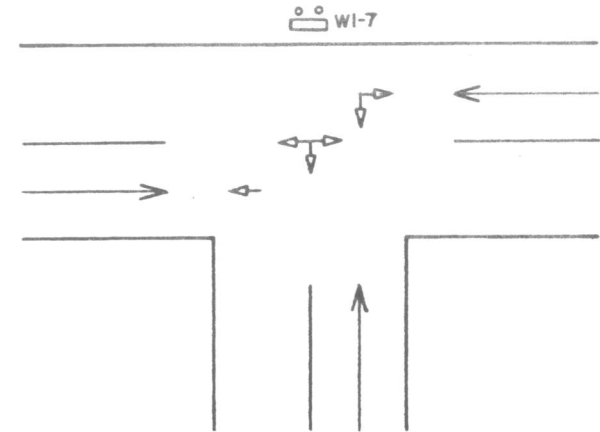
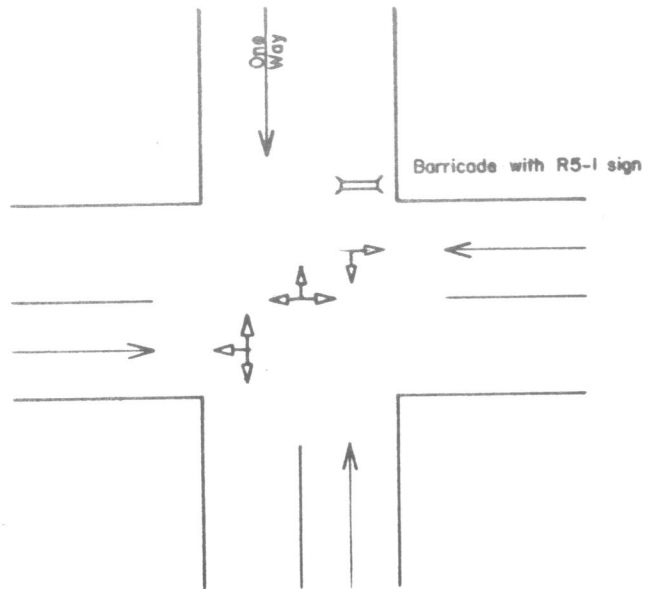
Use only when insufficient lanes to store turning vehicles



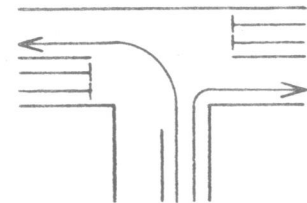
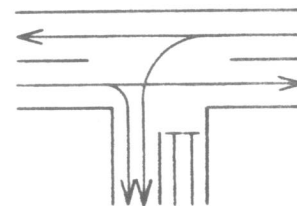
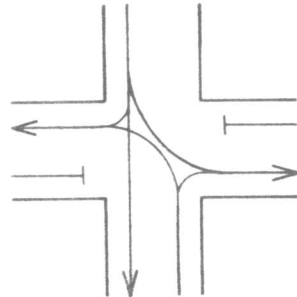
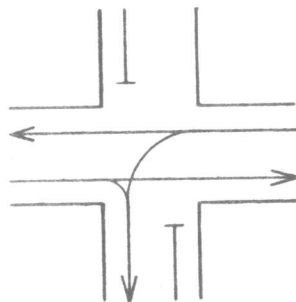
Signal	Phase A		Phase B		Phase C		Flash	
1-2	G	Y	R	R	R	R		
3-4	G	Y	R	R	R	R		
5-6	R	R	G	Y	R	R		
7-8	R	R	G	Y	R	R		
a-b	D	D	D	D	W	Fl.		
c-d	W	W	W	W	D	D		
Time	31.5	3	+	22.5	3	+	6	9
% Cycle	42	4		30	4		8	12
Dial Setting	0	42	46	76	80	88	0	

+ Possible all red clearance

"T" Intersections

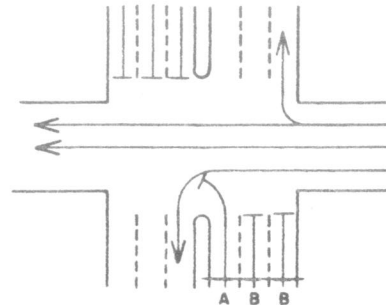
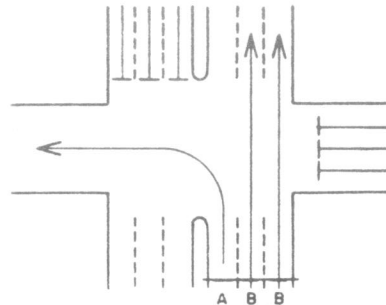
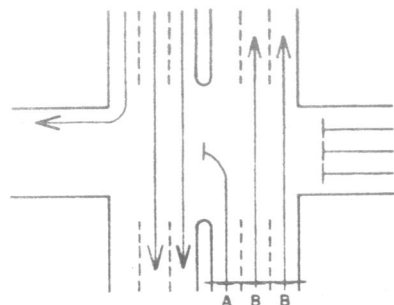


R
Y
G
All
Signals

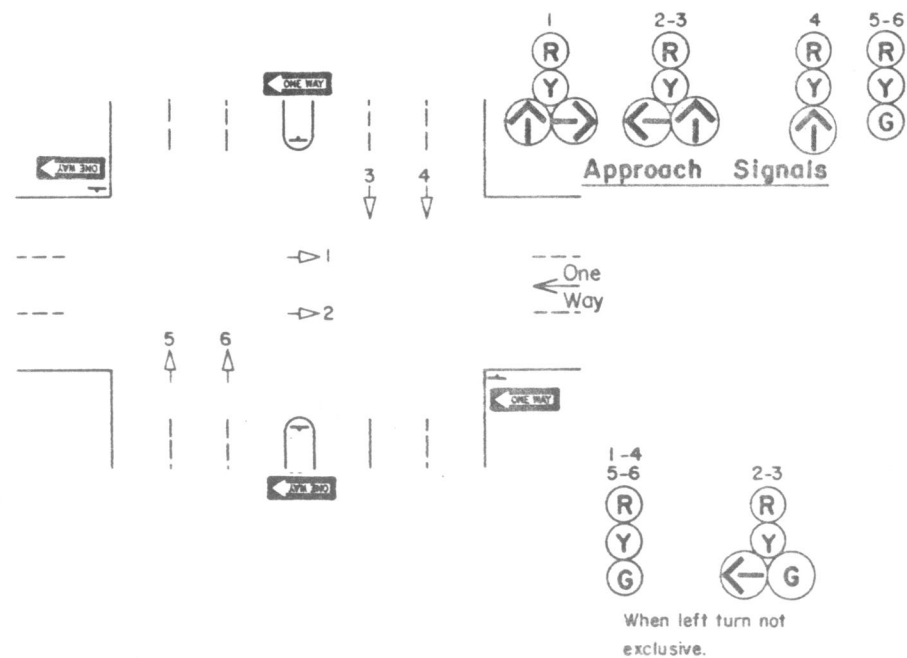
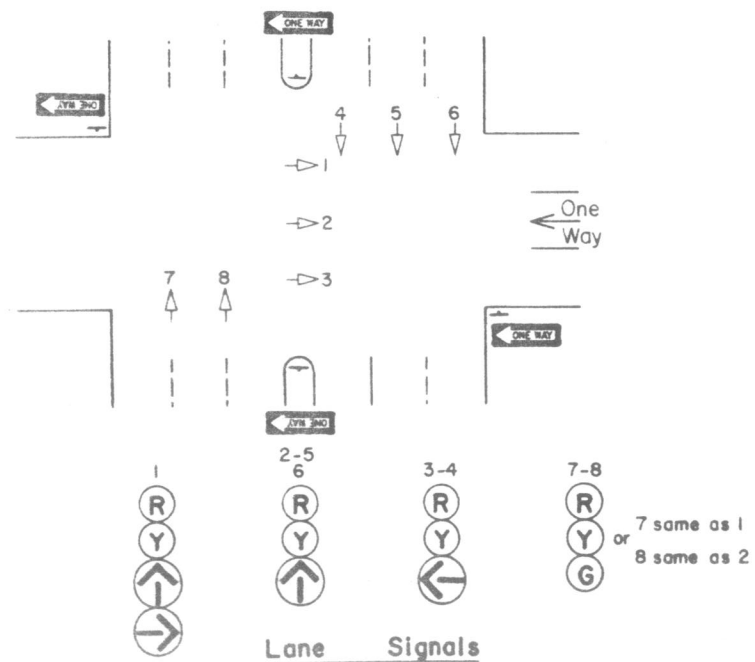


Left Turn Protection Exclusive Left Turn Lane

Movement Diagram



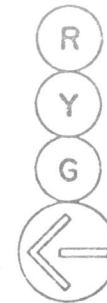
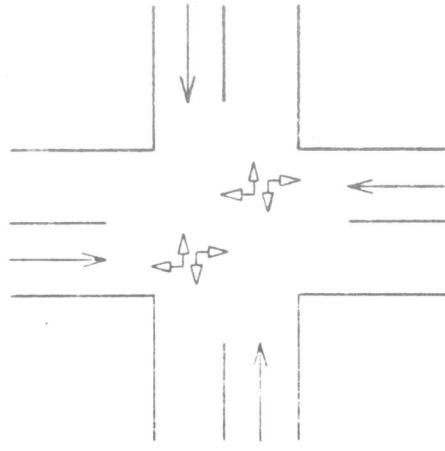
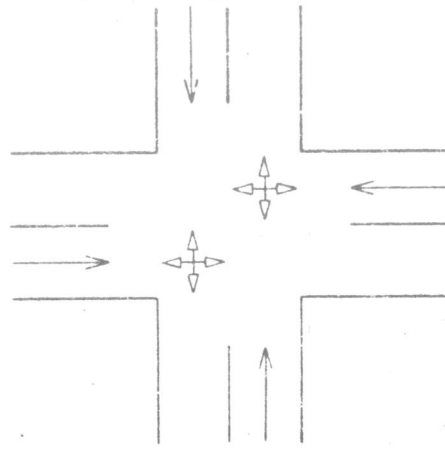
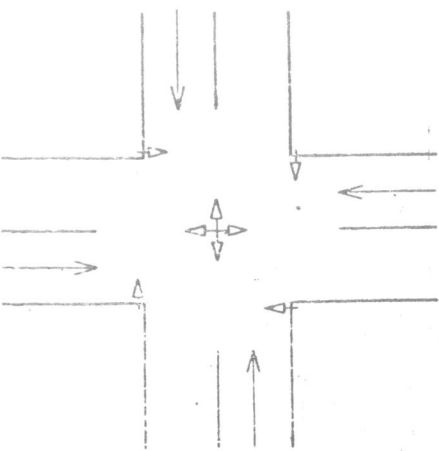
Signs



Intersection of Two, Two Way, Two Lane Streets

Showing Minimum Vehicular Signals only; Pedestrian movement may require Additional Signals

Acceptable Signal Placement

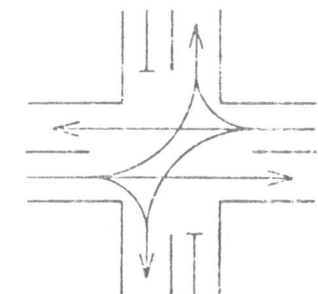
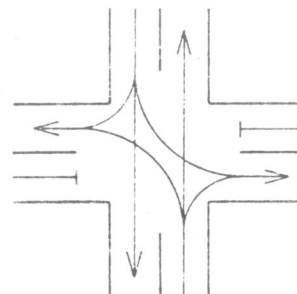
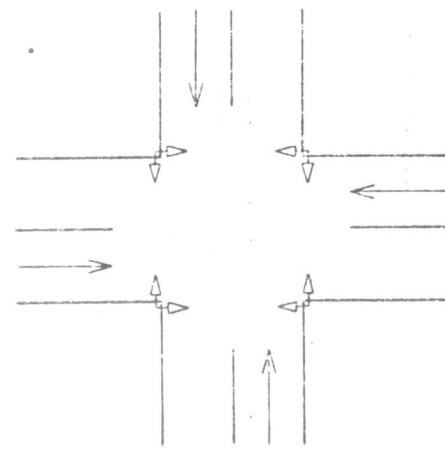
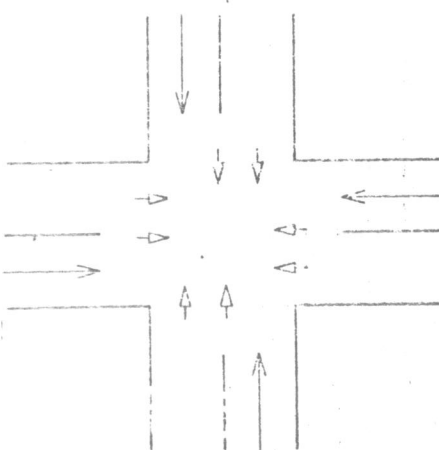


Adv. Left
Turn Signal

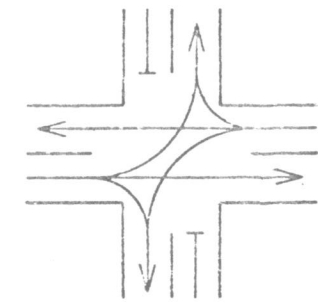
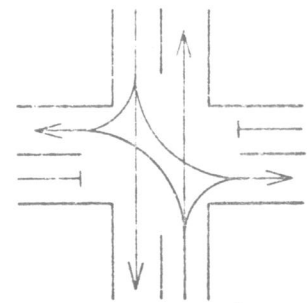
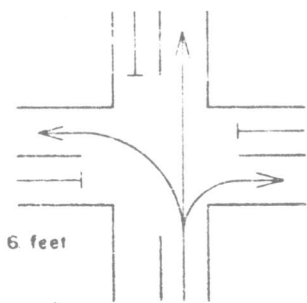


All
Others

Arrow lens should be 12",
all others may be 6" or 12".



Two Phase Operation



Two Phase with Advance Green on One Phase

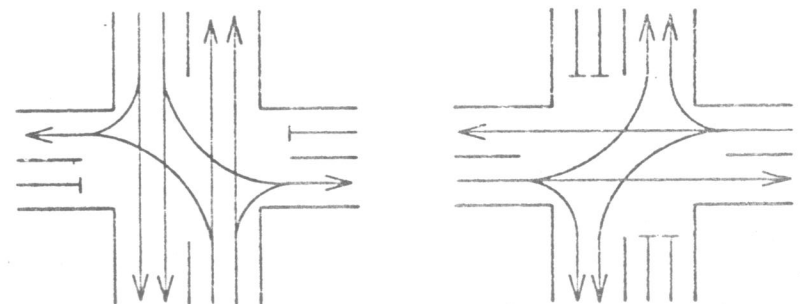
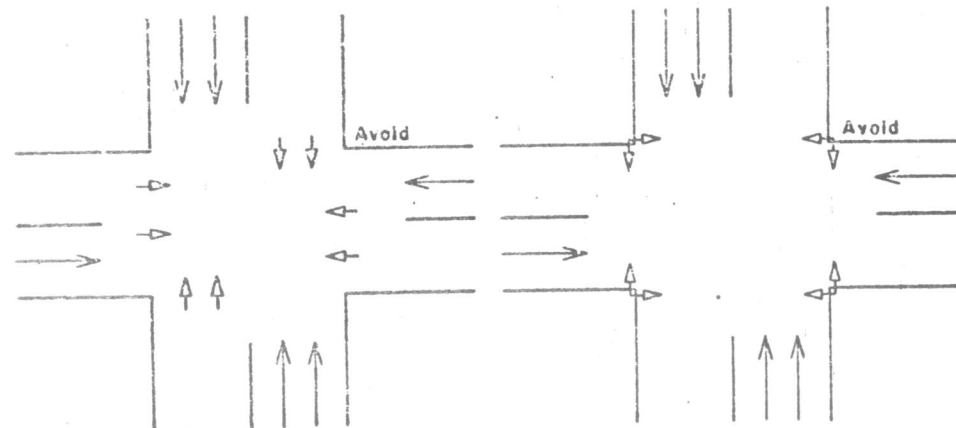
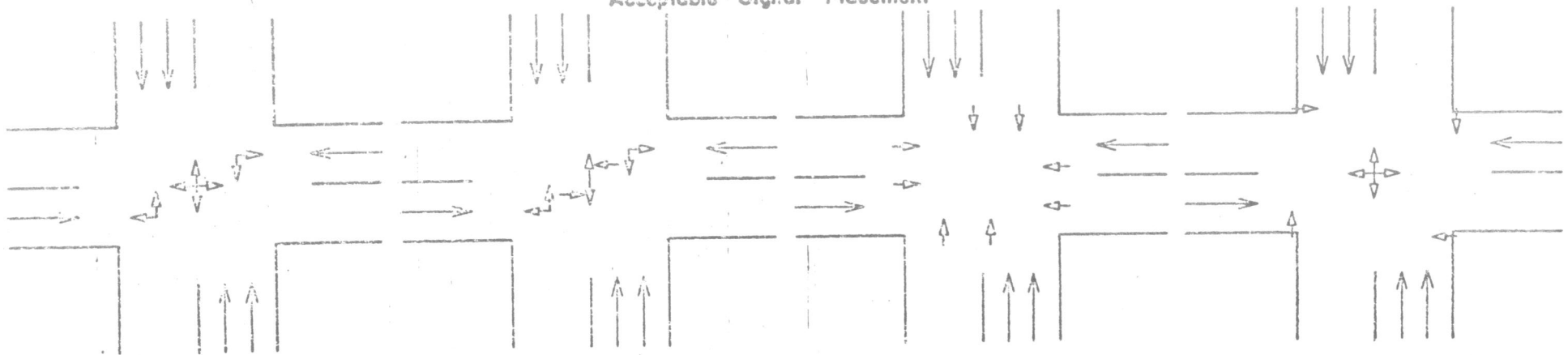
Left signal when suspended shall be in center of highway or left of center. It should not be more than 6 feet to the left of center.

Minimum horizontal distance between suspended signals on any approach shall be 9 feet, measured at right angles to the direction of the approach.

When indicating Advance Left Turn protection the arrow shall be in Left signal only.

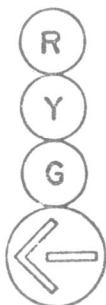
Intersection of One, Two Way, Two Lane Street, and a Two Way, Four Lane Street
Showing Minimum Vehicular Signals only; Pedestrian movement may require Additional Signals

Acceptable Signal Placement



Two Phase Operation

Arrow placement see notes on Sheet 1.

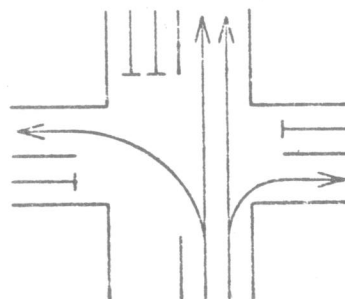


Adv. Left
Turn Signal

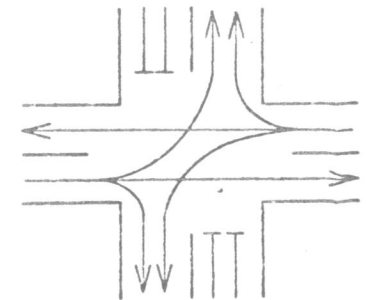
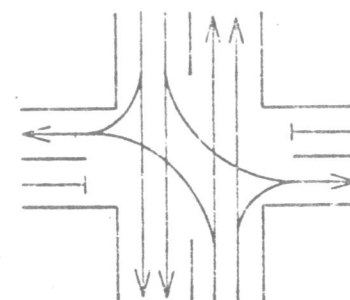


All
Others

Arrow lens should be 12",
all others may be 8" or 12".



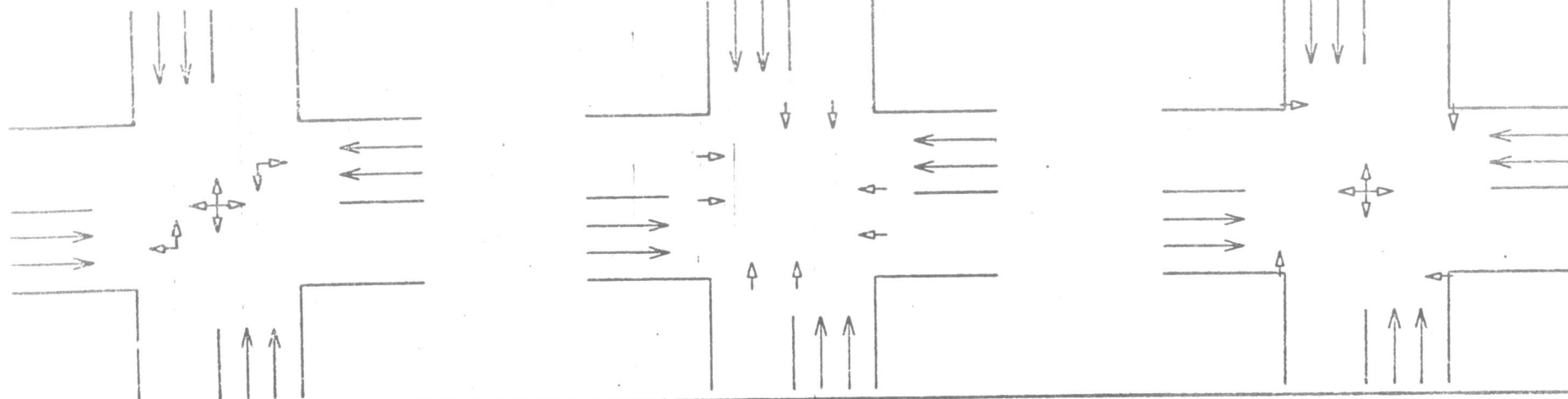
Two Phase with Advance Green on One Phase



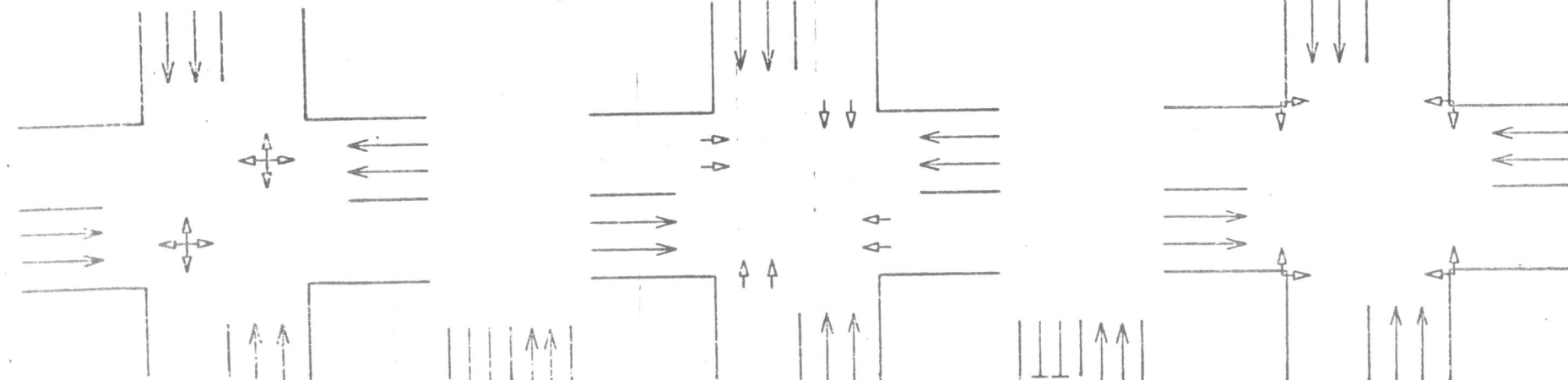
Intersection of Two, Two Way Four Lane Streets

Showing Minimum Vehicular Signals only; Pedestrian movement may require Additional Signals

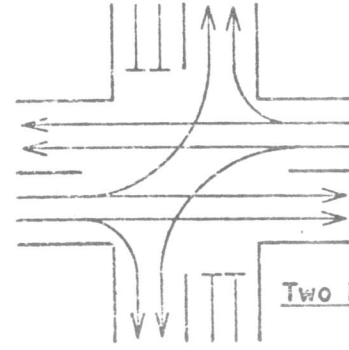
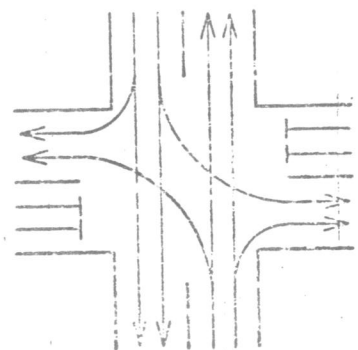
Acceptable Signal Placement



Acceptable But Not Recommended Placement



Arrow Placement and Details see notes on sheet 2.



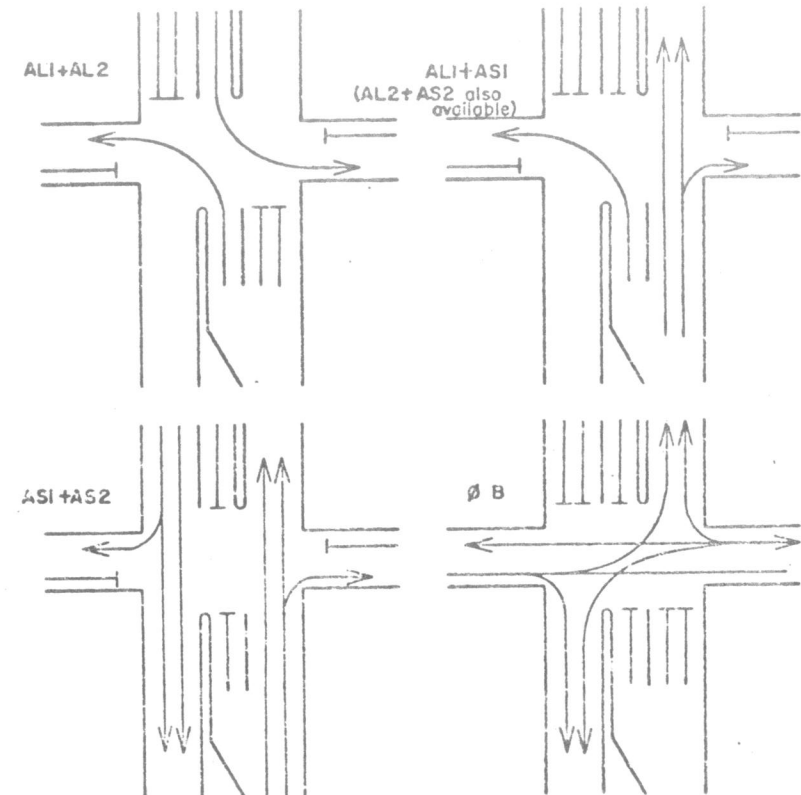
Two Phase Operation

Two Phase with Advance Green on One Phase

See sheet 2 for 4 lane

sheet 1 for 2 lane

Showing Minimum Vehicular Signals only; Pedestrian movement may require Additional Signals



Movement Diagram

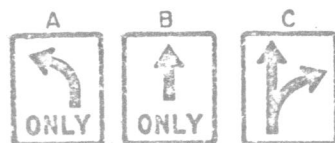
Signal 2 & 3 may show circular green or green arrows if opposing left turn lane is present and signalized for protected movement.

Signal 2 & 3 shall show circular green only if opposing left turn is not signalized for protected movement.

Near Side Island Signal Auxiliary only, signal 1 of any sketch may be used with 2 & 3 of other sketches.

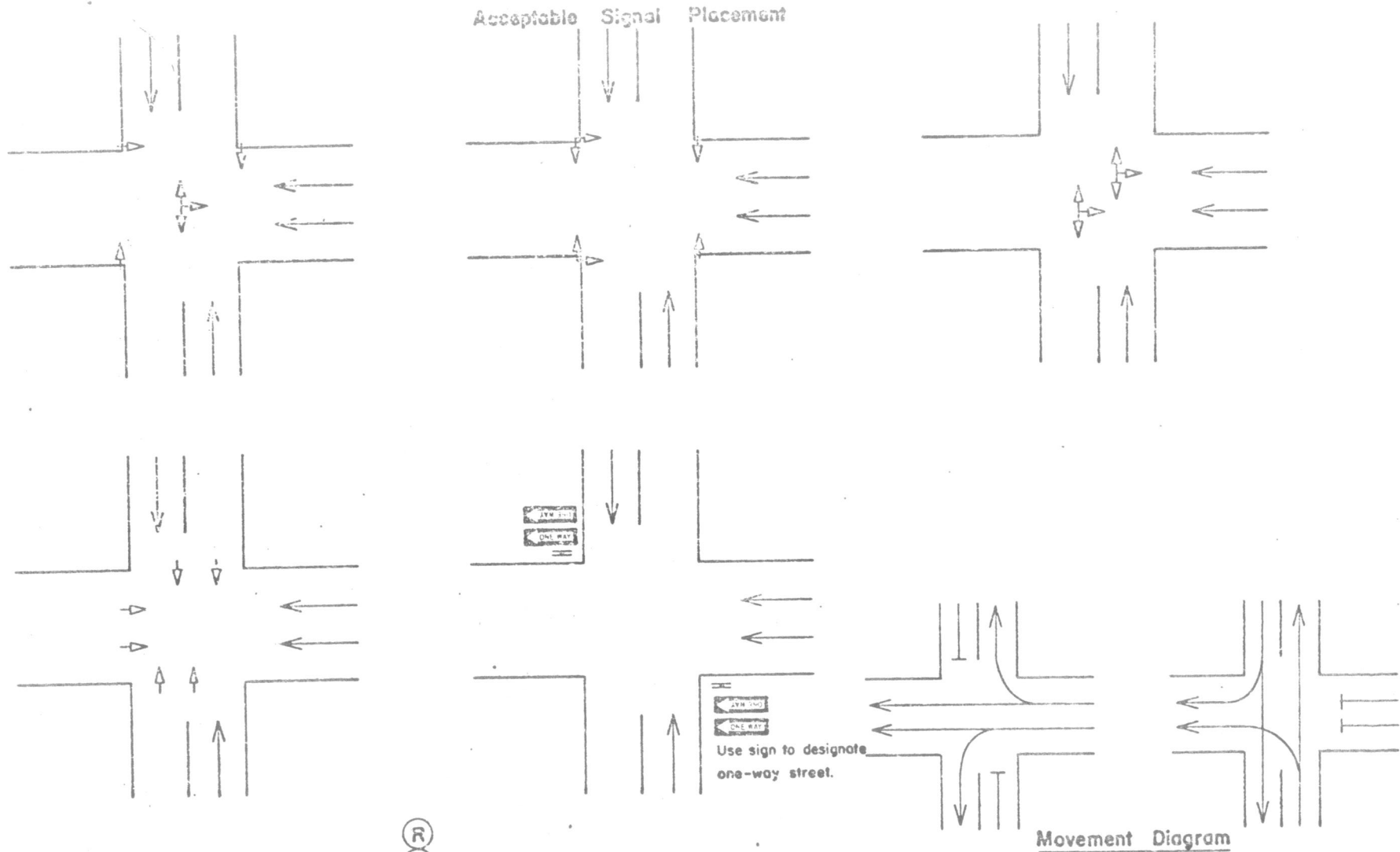
See sheet 7 for color sequence.

Use sign "Left Turn Signal" with signal #1.



A One Way Street Intersecting a Two Way Street

Showing Minimum Vehicular Signals only; Pedestrian movement may require Additional Signals

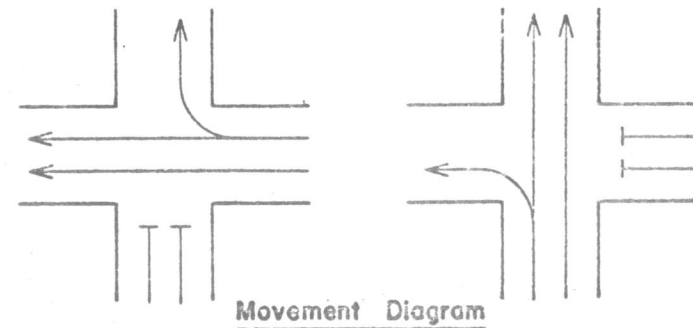
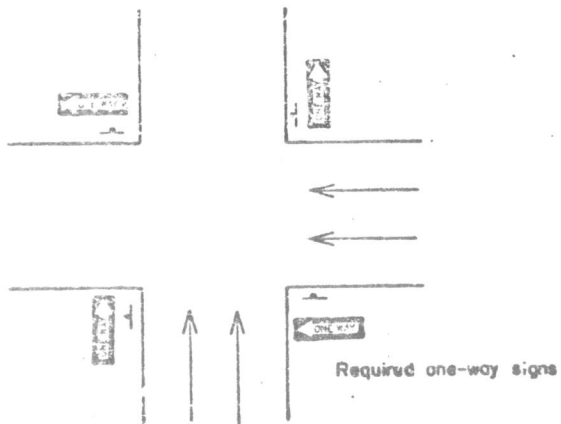
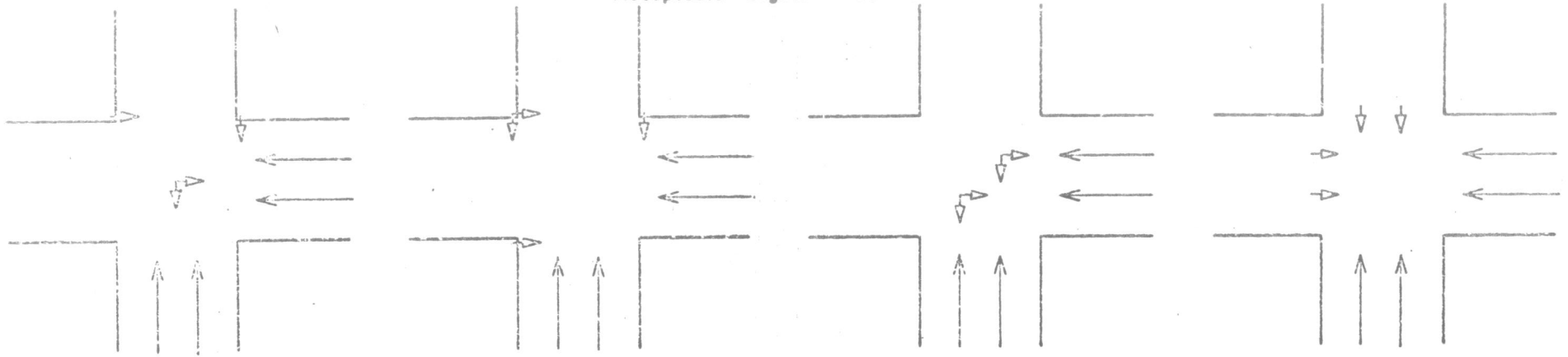


R
 Y
 G
 All
 Signals

Intersection of Two One Way Streets

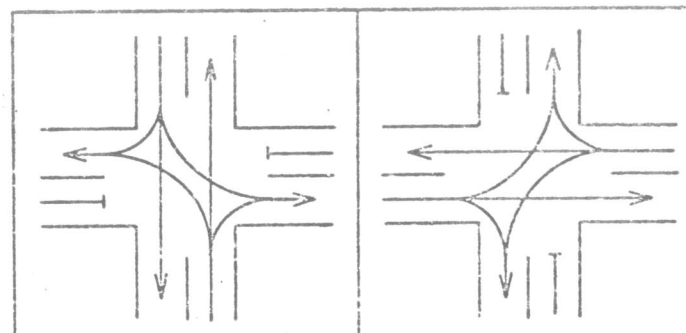
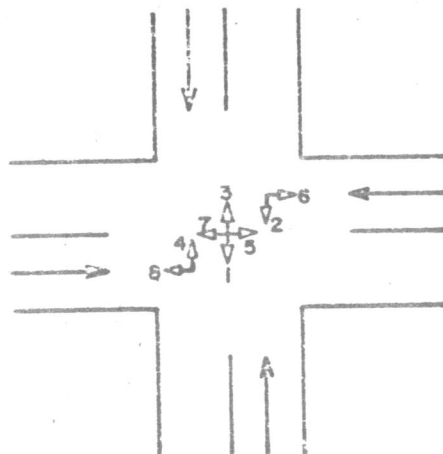
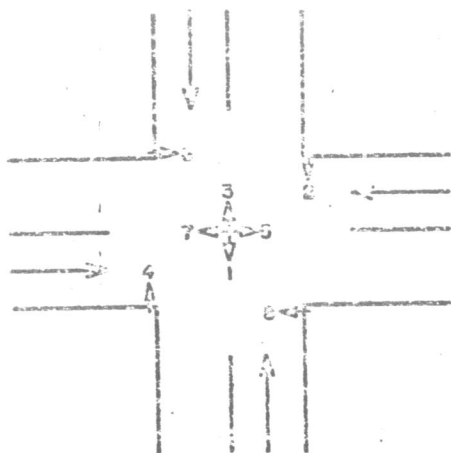
Showing Minimum Vehicular Signals only; Pedestrian movement may require Additional Signals

Acceptable Signal Placement



R
Y
G
All
Signals

Two Phase Operation Color Sequence and Movement Diagram

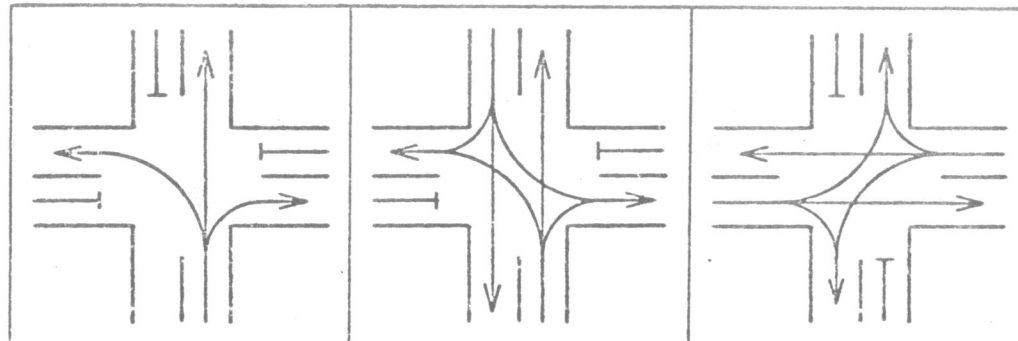
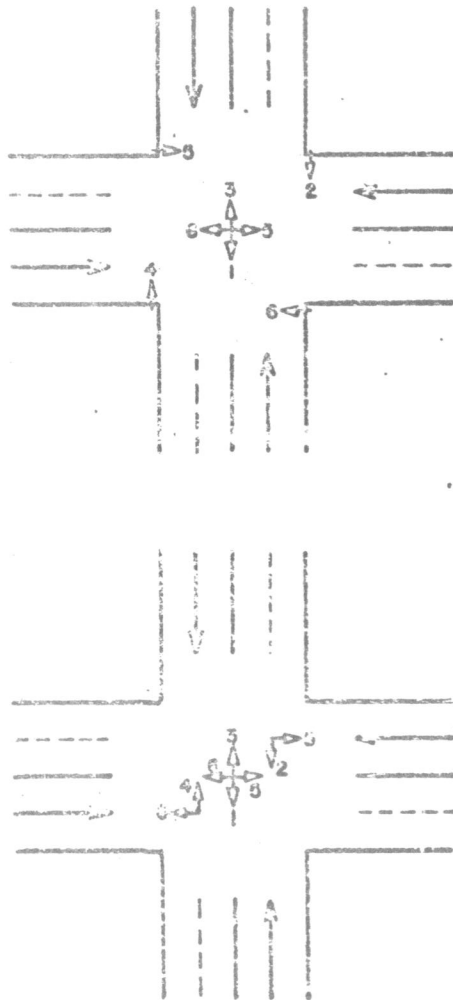


Signal	Phase A			Phase B				Flash
1 - 2	G	Y	R	R	R	R		Y
3 - 4	G	Y	R	R	R	R		Y
5 - 6	R	R	R	G	Y	R		R
7 - 8	R	R	R	G	Y	R		R
Pre-Timed			X			X		Actuated
Time								Fixed
% Cycle								Initial
Dial Setting								Vehicle
								Maximum

X Optional

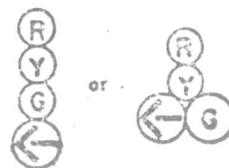
R
 Y
 G
 All
 Signals

Advance Left Turn Color Sequence and Movement Diagram



Signal	Advance A		Phase A			Phase B			Flash
1	G	G	G	Y	R	R	R	R	Y
2	G	G	G	Y	R	R	R	R	Y
3 - 4	R	R	G	Y	R	R	R	R	Y
5 - 6	R	R	R	R	R	G	Y	R	R
Pre-Timed					X			X	Actuated
Time									Fixed
% Cycle									Initial
Dial Setting									Vehicular
									Maximum

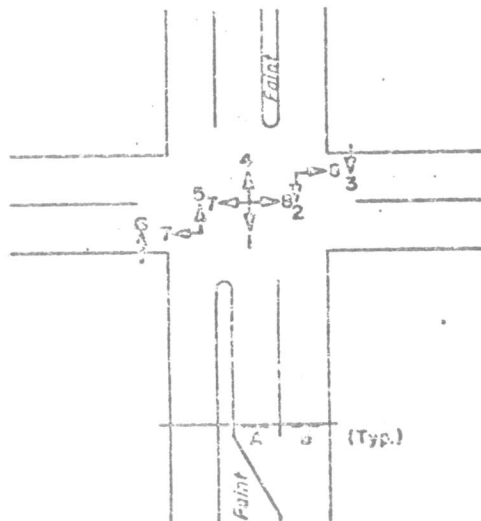
X Optional



Signal #1

All
Other
Signals

Advance Dual Left Turn Left Turn Not Denied



Signal	Advance A			Phase A			Phase B			Flash
1		Y	R	G	Y	R	R	R	R	Y
2-3	R	R	R	G	Y	R	R	R	R	Y
4		Y	R	G	Y	R	R	R	R	Y
5-6	R	R	R	G	Y	R	R	R	R	Y
7	R	R	R	R	R	R	G	Y	R	R
8	R	R	R	R	R	R	G	Y	R	R

* *
3 Sec. 2 Sec.

* Required



A

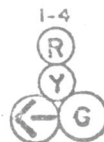


B

Signs



or



Signals

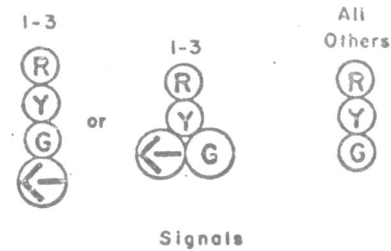
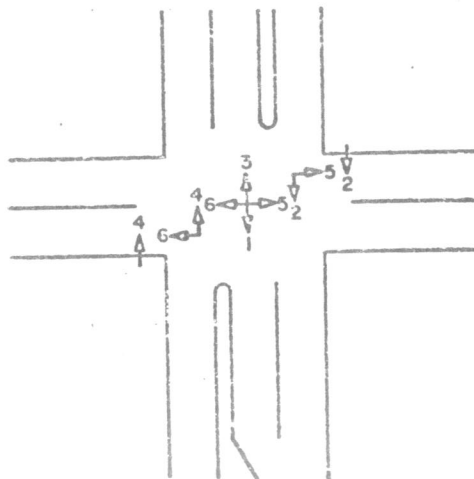


Advance and Lagging Left Turn (Lagging should be avoided)

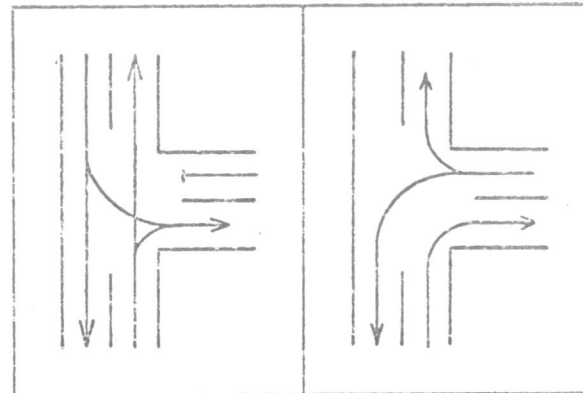
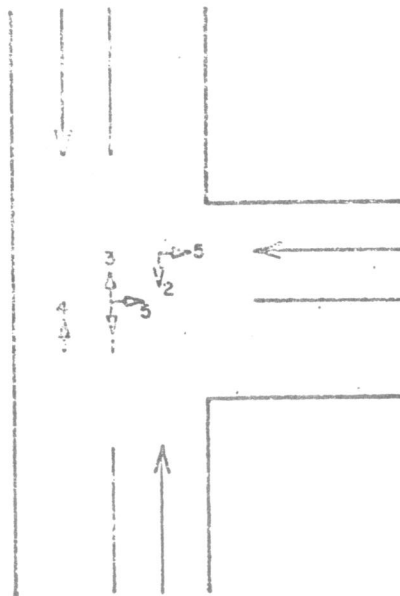
Signal	Advance A					Phase A		Logging A		Phase B			Flash
	Advance	A											
1	G ←	G	G	Y	R	R	R	R	R	R	R		
2	G	G	G	Y	R	R	R	R	R	R	R		
3	R	R	G	G	G	G	←	Y	R	R	R		
4	R	R	G	G	G	G	Y	R	R	R	R		
5	R	R	R	R	R	R	R	G	Y	R			
6	R	R	R	R	R	R	R	G	Y	R			
		*			*					**			

3 Sec.

* Mandatory
** Optional



Right Turn Arrow - When Followed By Thru Movement

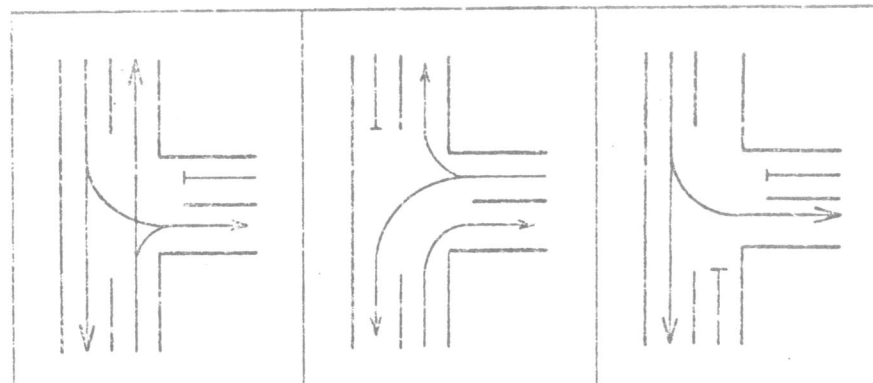
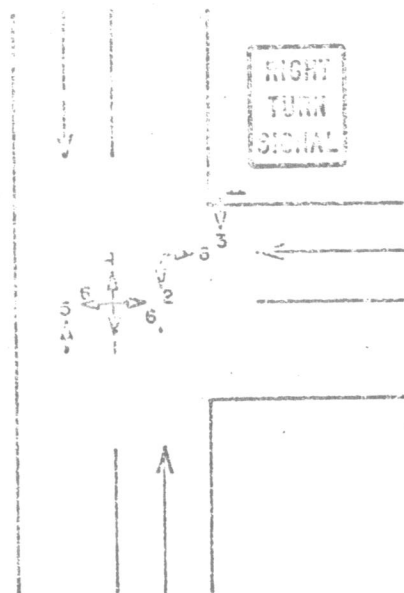


Signals	Phase A			Phase B				Flash
1	G	Y	R	R	R	R		Y
2	G	→	→	→	→	→		Y
3	G	Y	R	R	R	R		Y
4	G	Y	R	R	R	R		Y
5	R	R	R	G	Y	R		R
			*			*		

* Optional



Right Turn Arrow-When Not Followed By Thru Movement



Signals	Phase A			Phase B			Advance A			Flash
1-2	G	Y	R	R	R	R	R	R		Y
3	G	Y	R	R	Y	R	R	R		Y
4	G	Y	R	R	R	R	G	G		Y
5	G	Y	R	R	R	R	G	G		Y
6	R	R	R	G	Y	R	R	R		R
	3	3	2		3	2				

■

■

■ ■

■ Optional

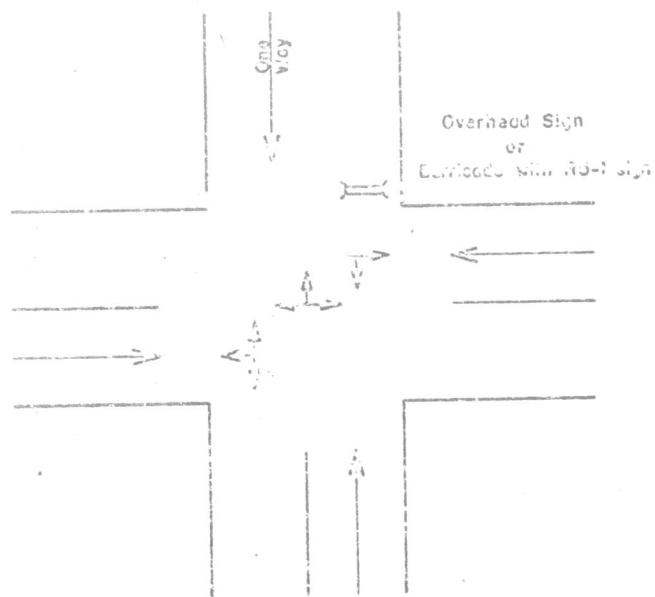
■ ■ Mandatory



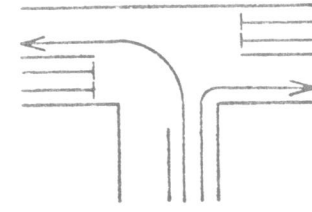
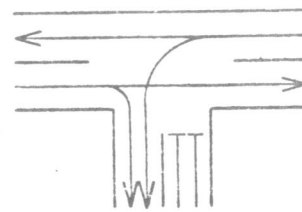
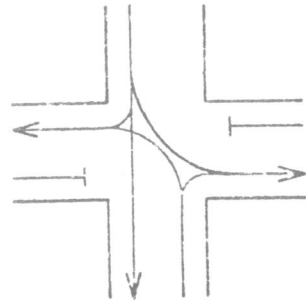
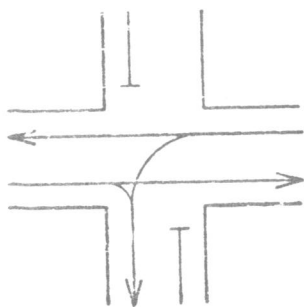
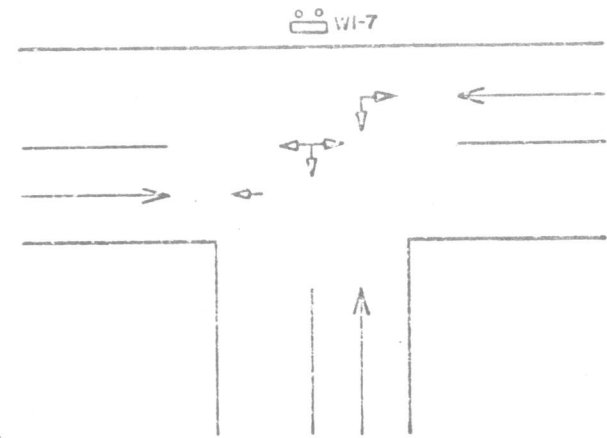
or



"T" Intersections

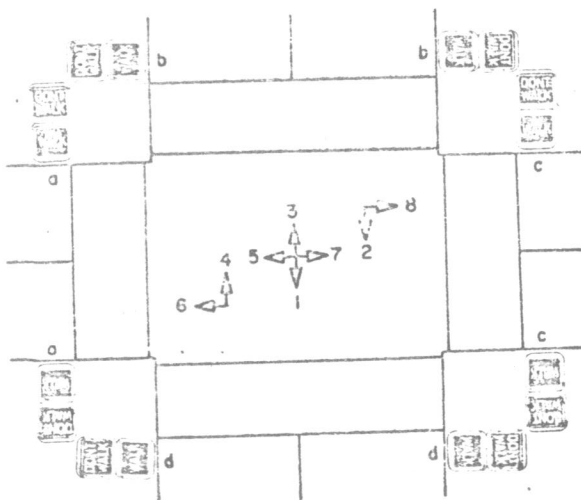
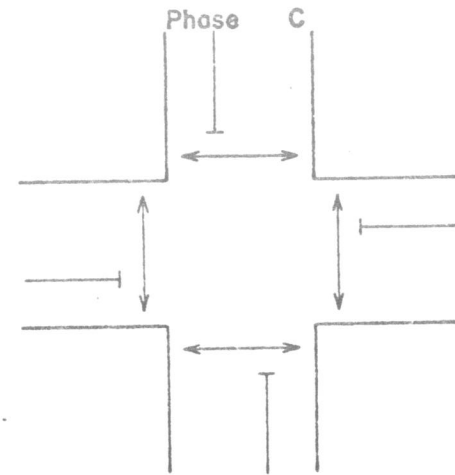
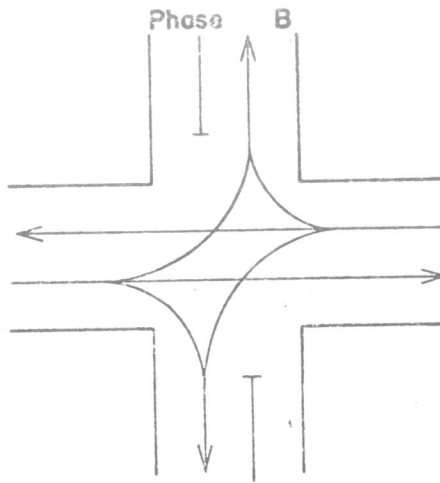
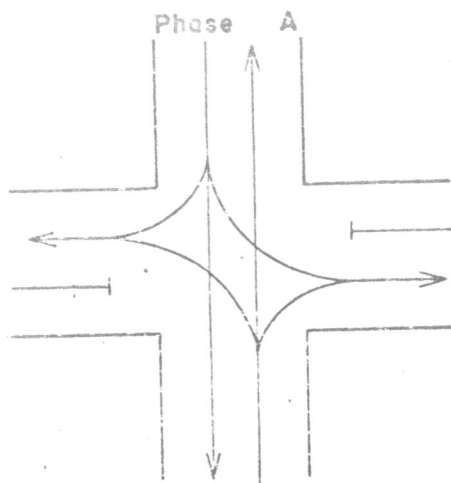


(R)
 (Y)
 (G)
 All
 Signals



Exclusive Walk-Don't Walk Phase

Use only when insufficient lanes to store turning vehicles



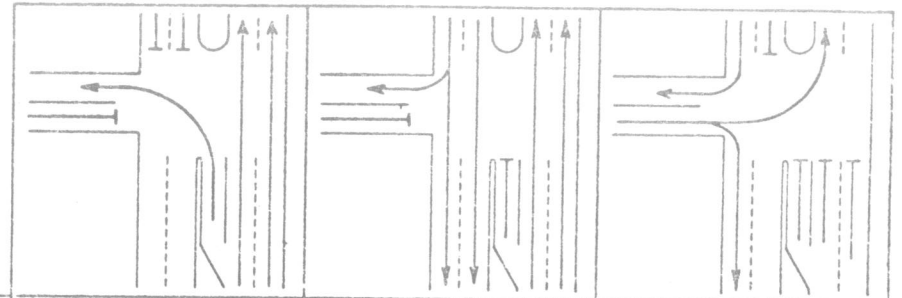
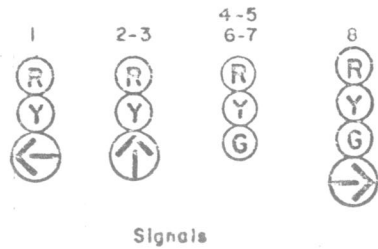
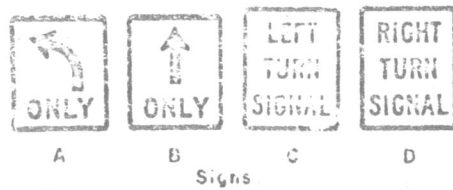
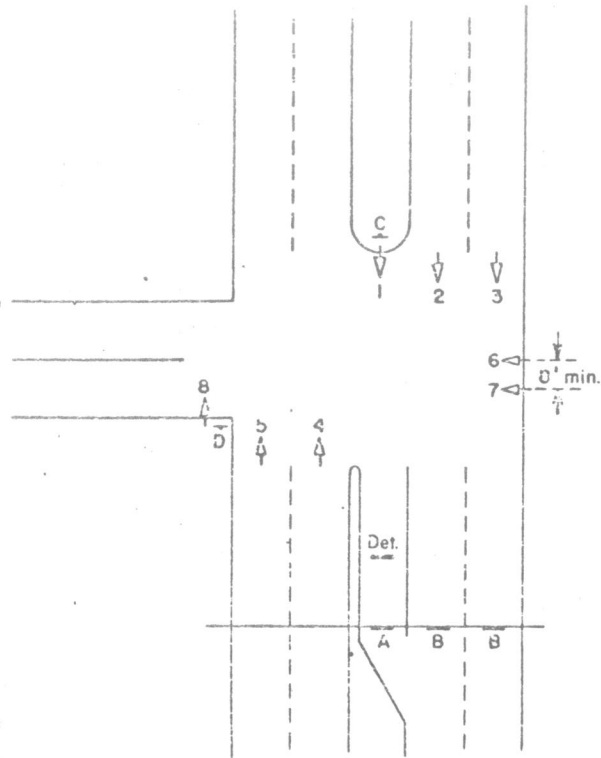
Signal	Phase A			Phase B			Phase C			Flash
1-2	G	Y		R	R		R	R		
3-4	G	Y		R	R		R	R		
5-6	R	R		G	Y		R	R		
7-8	R	R		G	Y		R	R		
a-b	D	W		D	W		W	FL		
c-d								DW		
Time	31.5	3	+	22.5	3	+	6	9*		75
%Cycle	42	4		30	4		8	12		100%
Dial Setting	0	42	46		76	80		88	0	

+ Possible all red clearance

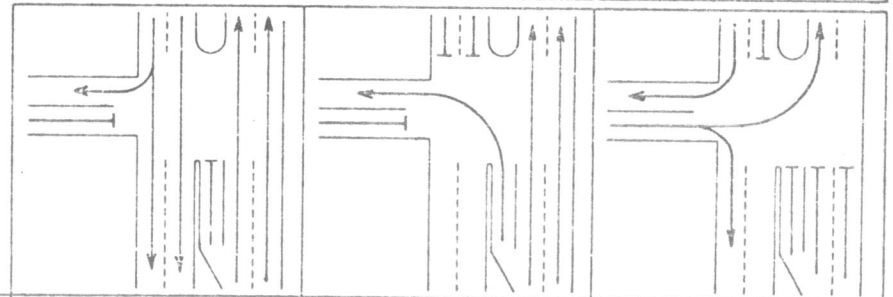
Flashing Don't Walk Preferred

* Time for this interval based on length of Cross Walk

Three Phase Operation

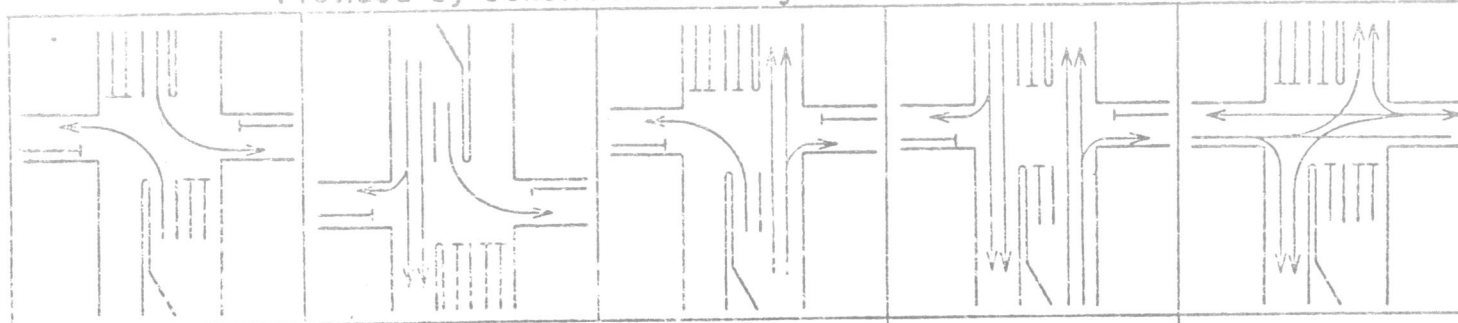


Signal	Phase A			Phase B			Phase C		
1	←	Y	R	R	Y	R	R	R	R
2	↑	↑	↑	↑	Y	R	R	R	R
3	↑	↑	↑	↑	Y	R	R	R	R
4	R	R	R	G	Y	R	R	R	R
5	R	R	R	G	Y	R	R	R	R
6-7	R	R	R	R	R	R	G	Y	R
8	R	R	R	G	Y	R	R	Y	R

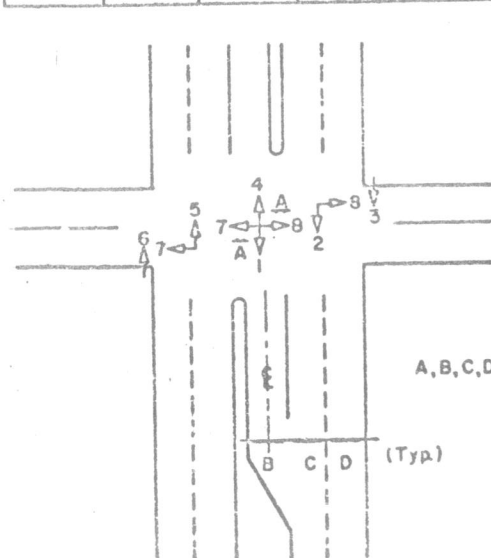


Signal	Phase A			Phase B			Phase C		
1	R	R	R	←	Y	R	R	R	R
2	↑	↑	↑	↑	Y	R	R	R	R
3	↑	↑	↑	↑	Y	R	R	R	R
4	G	Y	R	R	R	R	R	R	R
5	G	Y	R	R	R	R	R	R	R
6-7	R	R	R	R	R	R	G	Y	R
8			No f	Required					

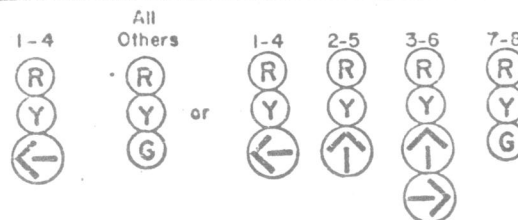
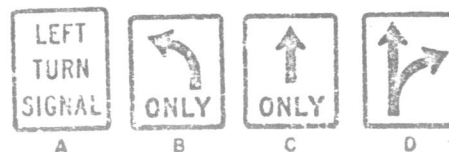
Left Turn Staged-by Lanes Provided by Construction or Signs and Pavement Markings



	AL1+AL2			AL1+AS1			AL2+AS2			AS1+AS2			S				Flesh
1	R	①	①	R	R	R	←	Y	R	R	R	R	R	R	R		
2	R	R	R	R	R	R	G	G	G	G	④	④	R	R	R		
3	R	R	R	R	R	R	G	G	G	G	④	④	R	R	R		
4	R	②	③	←	Y	R	R	R	R	R	R	R	R	R	R		
5	R	R	R	G	G	G	R	R	R	G	⑤	⑤	R	R	R		
6	R	R	R	G	G	G	R	R	R	G	⑤	⑤	R	R	R		
7-8	R	R	R	R	R	R	R	R	R	R	R	R	G	Y	R		

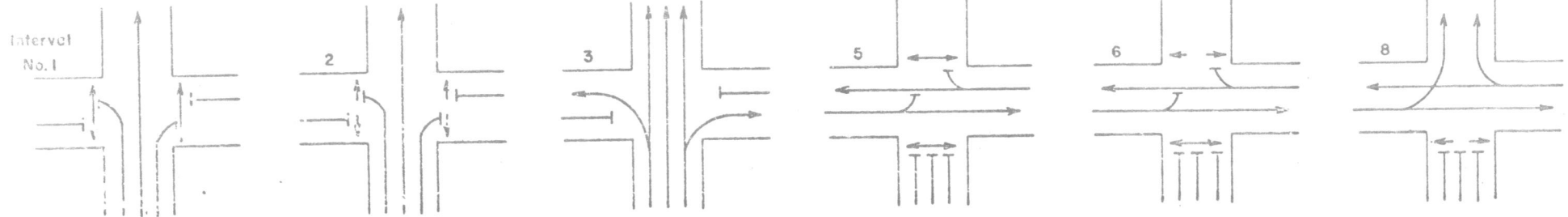


A, B, C, D see signs



- ① Remains R over ← when followed by AL2 + AS2
- ② and ③ Remains R over ← when followed by AL1 + AS1
- ② Becomes Y when followed by AL2 + AS2 or AS1 + AS2
- ③ Becomes R when followed by AL2 + AS2 or AS1 + AS2
- ④ Remains G when followed by AL2 + AS2
- ⑤ Remains G when followed by AL1 + AS1

Split Phase-One Way Street Intersecting a Two Way Street (Pedestrians move first-then vehicular turns)

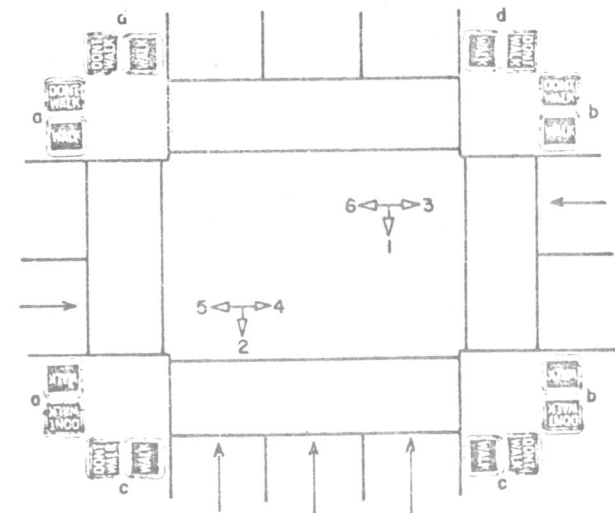
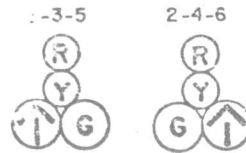


Signals	1	2	3	4	5	6	7	8	9		Flash
1	+	+	G	Y	R	R	R	R	R		Y
2	+	+	G	Y	R	R	R	R	R		Y
3	R	R	R	R	+	+	G	G	Y		R
4	R	R	R	R	+	+	G	G	Y		R
5	R	R	R	R	+	+	G	G	Y		R
6	R	R	R	R	+	+	G	G	Y		R
a	W	FL	D	W	FL	D	W	FL	D	W	
b	W	FL	D	W	FL	D	W	FL	D	W	
c	D	W	D	W	D	W	D	W	D	W	
d	D	W	D	W	D	W	D	W	D	W	
Time	6	11.25	18	3	6	11.25	9	7.5	3		75
% Cycle	8	15	24	4	8	15	12	10	4		100
Dial Setting	8	23	47	51	59	74	86	96	0		

All Signals



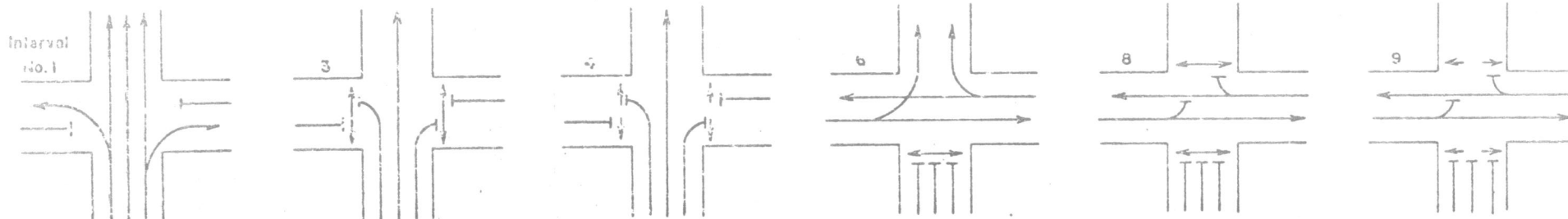
or



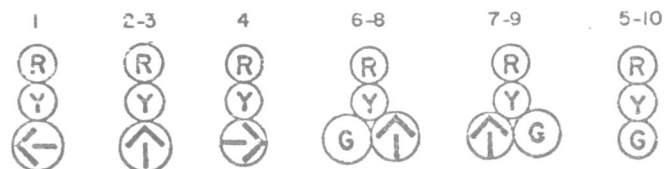
Flashing Don't Walk Preferred for Pedestrian Clearance
Flashing Don't Walk Time based on length of Cross Walk

Signing one way streets see sheet #5

Split Phase-One Way Street Intersecting a Two Way Street (Vehicles turn first-then pedestrian movement)



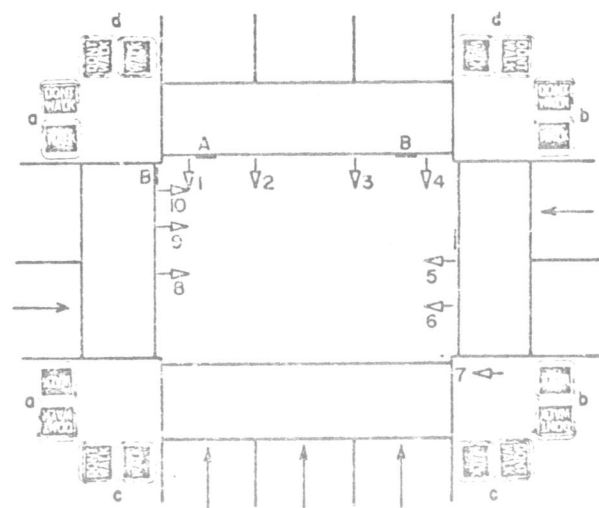
Signals	1	2	3	4	5	6	7	8	9	10	Flash
1	←	Y	R	R	R	R	R	R	R	R	
2-3	↑	↑	↑	↑	Y	R	R	R	R	R	
4	→	Y	R	R	R	R	R	R	R	R	
5	R	R	R	R	R	G	Y	R	R	R	
6-7	R	R	R	R	R	G	Y	↑	↑	Y	
8-9	R	R	R	R	R	G	Y	↑	↑	Y	
10	R	R	R	R	R	G	Y	R	R	R	
a	D. W.	D. W.	W	FL D.W.	FL D.W.	D. W.	D. W.	D. W.	D. W.	D. W.	
b	D. W.	D. W.	W	FL D.W.	FL D.W.	D. W.	D. W.	D. W.	D. W.	D. W.	
c	D. W.	D. W.	W	D. W.	D. W.	D. W.	D. W.	W	FL D.W.	FL D.W.	
d	D. W.	D. W.	W	D. W.	D. W.	D. W.	D. W.	W	FL D.W.	FL D.W.	
Time	18	3	6	7.5	3	18	3	6	7.5	3	75
% Cycle	24	4	6	10	3	24	4	6	10	3	100
Dial Setting	24	28	36	46	50	74	73	66	96	0	



Signals



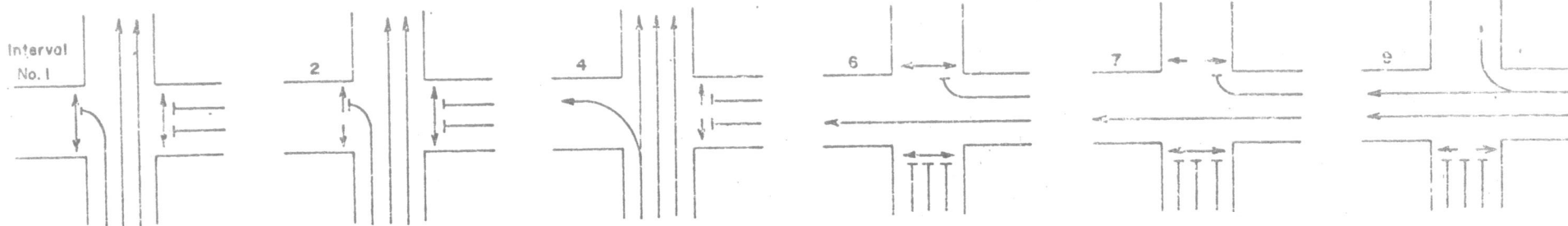
Signs



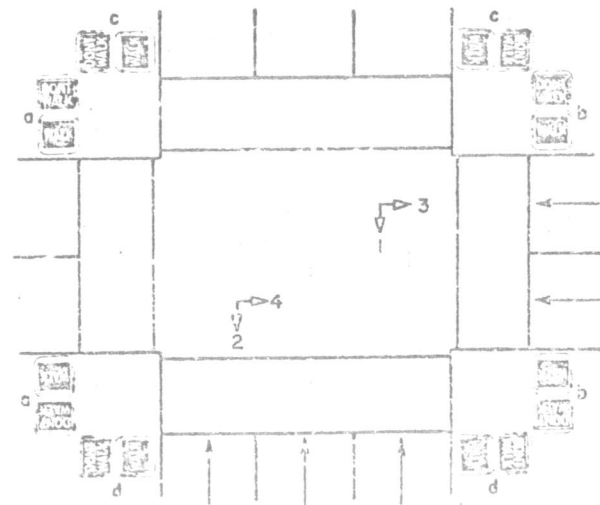
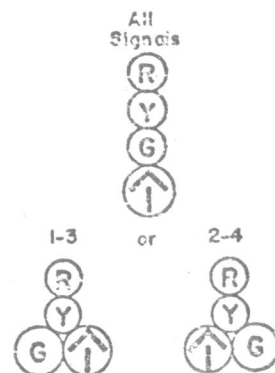
Signing on way streets see sheet # 5

Flashing Don't Walk Preferred for Pedestrian Clearance
Flashing Don't Walk Time based on length of Cross Walk

Split Phase-Intersection of Two, One Way Streets (Pedestrians move first-then vehicular turns)

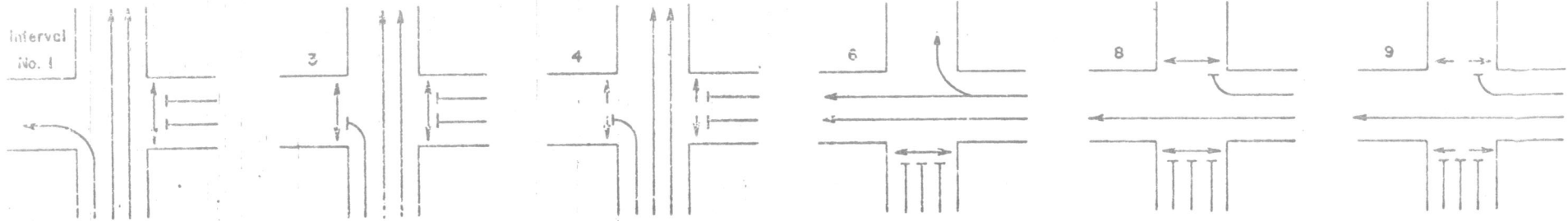
[illegible]

Flashing Don't Walk Preferred for Pedestrian Clearance
Flashing Don't Walk Time based on length of Cross Walk

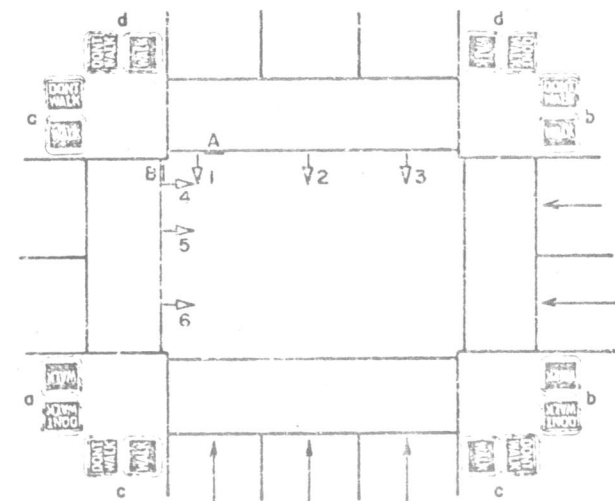
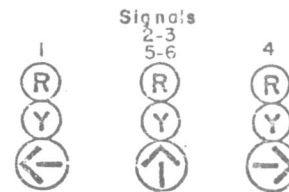
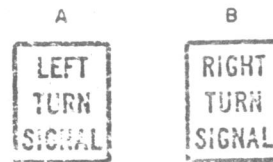


Singing one way streets see sheet #5

Split Phase-Intersection of Two, One Way Streets (Vehicles turn first—than pedestrian movement)



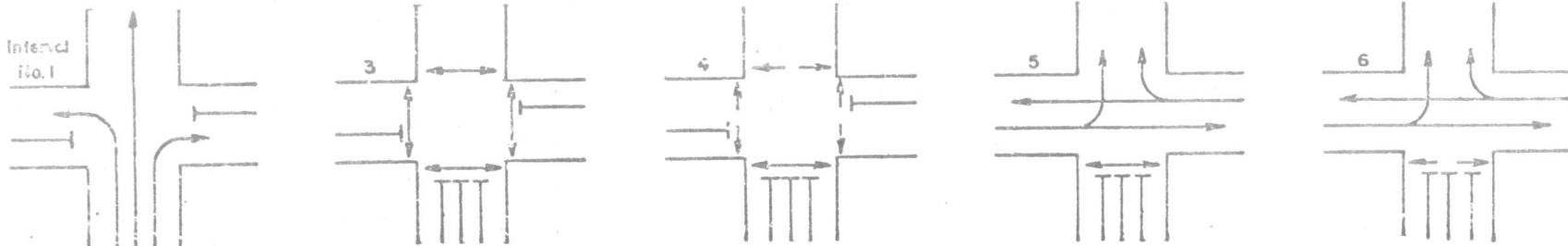
Signals	1	2	3	4	5	6	7	8	9	10	Flash
1	←	Y	R	R	R	R	R	R	R	R	Y
2-3	↑	↑	↑	↑	Y	R	R	R	R	R	Y
4	R	R	R	R	R	→	Y	R	R	R	R
5-6	R	R	R	R	R	↑	↑	↑	↑	Y	R
g	D.W.	D.W.	W	Fl.	Fl.	D.W.	D.W.	D.W.	D.W.	D.W.	
b	W	W	W	Fl.	Fl.	D.W.	D.W.	D.W.	D.W.	D.W.	
c	D.W.	D.W.	D.W.	D.W.	D.W.	W	W	W	W	Fl.	Fl.
d	D.W.	D.W.	D.W.	D.W.	D.W.	D.W.	D.W.	D.W.	D.W.	Fl.	Fl.
Time	18	3	6	7.5	3	18	3	6	7.5	3	75
% Cycle	24	4	8	10	4	24	4	8	10	4	100%
Dial Setting		24	28	36	46	50	74	78	86	96	0



Flashing Don't Walk Preferred for Pedestrian Clearance
Flashing Don't Walk Time based on length of Cross Walk

Signing one way street see sheet #6

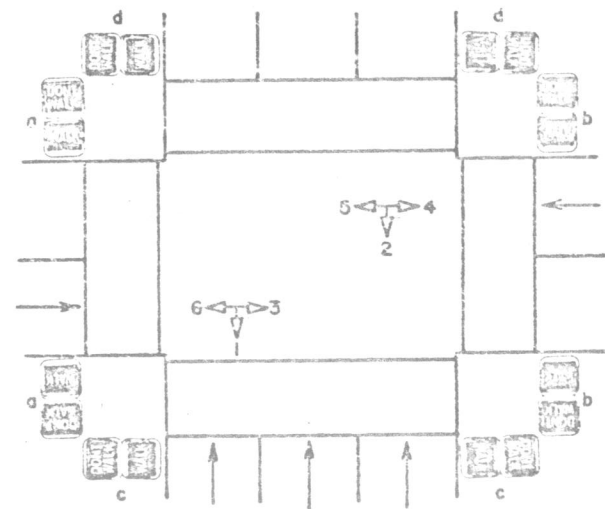
One Way Street Intersecting a Two Way Street



Diagonal Crossing Not Permitted

Signals	1	2	3	4	5	6	7			Flash
1	G	Y	R	R	R	R	R			Y
2	G	Y	R	R	R	R	R			Y
3	R	R	R	R	G	G	Y			R
4	R	R	R	R	G	G	Y			R
5	R	R	R	R	R	G	Y			R
6	R	R	R	R	G	G	Y			R
a	D W	D W	W FL DW	D W	D W	D W	D W			off
b	D W	D W	W FL DW	D W	D W	D W	D W			off
c	D W	D W	W W W	W FL DW	FL DW	FL DW	FL DW			off
d	D W	D W	W FL DW	D W	D W	D W	D W			off
Time	225	3	6	125	2175	75	3			75
% Cycle	30	4	8	15	29	10	4			100
Dial Setting	30	34	42	57	63	90	C			

Flashing Don't Walk Preferred for Pedestrian Clearance
Flashing Don't Walk Time based on length of Cross Walk



Signing one way streets see sheet #6

Quad Left Turn-Movement and Color Sequence

																												Flash
Signals	AL1+AL2			AL1+AS1			AL2+AS2			AS1+AS2			CL1+BL2			BL1+BS1			BL2+BS2			BS1+BS2						
1	R	Y①	R①	R	R	R	←	Y	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	Y				
2-3	R	R	R	R	R	R	→	Y②	R④	→	Y⑤	R⑤	R	R	R	R	R	R	R	R	R	R	R	Y				
4	R	Y②	R②	←	Y	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	Y				
5-6	R	R	R	→	Y③	R③	R	R	R	→	Y⑥	R⑥	R	R	R	R	R	R	R	R	R	R	R	Y				
7	R	R	R	R	R	R	R	R	R	R	R	R	←	Y⑦	R⑦	R	R	R	←	Y	R	R	R	R				
8-9	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	→	Y⑩	R⑩	→	Y⑪	R⑪				
10	R	R	R	R	R	R	R	R	R	R	R	R	←	Y⑧	R⑧	←	Y	R	R	R	R	R	R	R				
11-12	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	→	Y⑨	R⑨	R	R	R	→	Y⑫	R⑫				
Fixed																												
Initial Interval																												
Vehicle Interval																												
Maximum																												

1 Remains $\leftarrow R$ if followed by AL2 + AS2

2 " $\leftarrow R$ " " " AL1 + AS1

3 " $\rightarrow$ " " " AS1 + AS2

4 " $\rightarrow$ " " " AS1 + AS2

5 " $\rightarrow$ " " " AL2 + AS2

6 " $\rightarrow$ " " " AL1 + AS1

AL1 "A" Phase Left Turn 1 AS1 "A" Phase Straight Ahead 1

AL2 "A" Phase Left Turn 2 AS2 "A" Phase Straight Ahead 2

Phase B same treatment

7 Remains $\leftarrow R$ if followed by BL2 + BS2

8 " $\leftarrow R$ " " " BL1 + BS1

9 " $\uparrow \rightarrow$ " " " BS1 + BS2

10 " $\uparrow \rightarrow$ " " " BS1 + BS2

11 " $\uparrow \rightarrow$ " " " BL2 + BS2

12 " $\uparrow \rightarrow$ " " " BL1 + BS1