

1.0 IMPROVEMENT PLAN DESIGN CRITERIA

The following sections intent is to provide the design engineer for public improvement plans (Signing and Striping, Street Lighting, and Traffic Signals) the information that will be reviewed when plan check submittals are made to the City. The purpose of the City's review of the plan is to assure conformance with the City's standards and policies and that the proposed design is acceptable to the City.

In addition to the standards set by the City, this section functions as a guideline to describe the typical practices for Traffic and Transportation projects within the City of Ontario. The guidance of this document acts as a supplement to the 2006 California Manual on Uniform Traffic Control Devices (CAMUTCD), the Highway Design Manual, Standard Plans, Standard Specifications, the City's Special Provisions, and other current design policies. It is the responsibility of the Designer to be knowledgeable in the Traffic Engineering Principles used in the design of Traffic and Transportation Projects.

It is the responsibility of the Engineer to check the plan for errors **BEFORE** submittal to the City. Plans submitted for review with numerous design and/or drafting errors, or with a poor quality of draftsmanship may be returned for resubmittal without being reviewed.

All plans submitted to the City for review shall be accompanied by the appropriate "Design Submittal Checklist" filled out by the engineer. The checklists can be found in Appendix A of this document. All items on the check list must be met prior to submittal to the City.

Plans being resubmitted to the city shall include the plans, appropriate design review checklist, the design guide containing the City's comment from the previous design review and previous redlined plans. Plans submitted to the City without the afore mentioned items, or without **ALL** items from the previous design review being addressed **WILL BE RETURNED WITHOUT BEING REVIEWED!**

The designer should contact the Traffic Engineering Section at (909) 395-2025 to determine whether there are any special requirements for a project.

1.1 General Drafting Standards

All plan sheets submitted shall be 24" x 36" with the standard City title block. Unless requested, title sheets are not required. No sticky backs or paste-ons will be accepted. At the time of final submittal copies of the drawings created using CAD drawing programs shall be provided to the City on a CD. All drawings submitted should utilize the "etransmit" feature and include any reference drawings, plot files and text files as necessary. Drawings created using programs other than Autodesk "AutoCAD" shall be submitted as DXF files. Signatures must be "original" on the final submittal.

A complete set of General Notes and Construction Notes shall be on the drawing. Projects with multiple sheets shall have a complete set of General Notes, Construction Notes, and/or legend of special symbols for the project on the first sheet of the set. Subsequent project sheets shall each have a set of Construction Notes, and/or legend of special symbols applicable to that sheet only. Abbreviations, standard notes or symbols shown on the Caltrans Standard Plans shall not be redefined on a project. In no case

should a Construction Note or symbol be defined differently on separate sheets of the same project. Any nonstandard symbol not defined shall not be used.

Reference to other drawings shall be made using the City assigned drawing number only. If a drawing number has not yet been assigned, leave a blank space. Drawing numbers will not be assigned until the City asks for originals.

Show surface features such as meter boxes, power poles, sidewalk, drive approaches, existing signs, striping and markings, catch basins, gutters, etc. and both existing and proposed signal poles and street lights. When pavement is other than A.C., show and label pavement types and limits.

Where Agency boundary lines divide the work on a drawing, an approval block shall be included for each affected agency. Show all such boundary lines.

North arrows shall be City standard and shall be placed above the plan scale in the lower right hand corner of the drawing. North shall be oriented toward either the top or the right side of the drawing.

Use short dashed lines to indicate equipment and improvements which are existing or are to be installed by another plan sheet. Solid lines, even though drawn narrower, can be erroneously construed as requiring installation of items that may exist. Due to the difficulty in scanning, plans using faded out lines will not be accepted.

All plans shall be submitted in ink. Sepia mylars will not be acceptable.

1.2 Signing and Striping Plans

The following standards shall be applied to all Signing and Striping Plans:

- The drawing scale of all Signing and Striping plans shall be 1" = 40'. Stationing shall not be used to describe the limits of the drawing or project in the title block.
- Details of signs or striping should only be shown when they differ from the Caltrans details.
- Traffic signing and striping plans are identified by "T- " drawing numbers.
- Existing signing and striping which will be removed by construction, such as street widening, need not be shown.
- Dimension all street and lane widths.
- Stationing should be shown, but shall not be used in-lieu of dimensions for taper dimensions, transitions, longitudinal dimensions or as needed to insure constructability.
- The designer should be realistic about trying to reuse/relocate existing signs within the area of construction.
- Signs should be installed on street lights as much as possible. Where the sidewalk is adjacent to the curb, all signs not to be installed on street lights shall be installed behind the sidewalk.
- Existing signs not within the removal area shall be provided with a note/remark as to the type of sign and whether it is to be removed/relocated or protect-in-place.

- For determining the minimum distance for placement of advance warning signs refer to the CAMUTCD Table 2C-4.
- There is a legal definition for, and a difference between parking and stopping. Use R26 (CA) signs (No Parking) to restrict parking where the outside travel lane is equal to or greater than 18' wide. Use R26(S) (CA) signs (No Stopping) where the outside travel lane is less than 18' wide. Do not install R26(S) (CA) signs on the same post as a stop sign. When the limits of the restricted areas are not clear, or not at an intersection, use the corresponding R28 (CA) sign.
- Construction notes for striping should indicate type of work to be performed (install, paint, remove), description of installation (solid-double yellow, 4" white lane line, etc.), and if not a removal, the Caltrans detail number. "Install" thermoplastic markings/legends or lines with markers and "paint" other lines, legends and marking. *Example: (1) – Paint solid double yellow centerline. Caltrans Detail #21.*
- All new striping shall be shown graphically correct (8" stripe shown wider than a 4" stripe, etc.).
- In order to relate the proposed striping to the existing striping, show the existing striping with dimensions on cross streets and at either end of the project's boundaries, even if separated by an intersection. Provide lane width dimensions on either end of any transitions of lane width. Provide dimensions from the beginning and end of a transition to a physical feature that can be measured to in the field (B.C.R., E.C.R., street light, fire hydrant, etc.)
- Except for speed limit markings, all legends, striping, and marking installed at the ultimate design shall be thermo-plastic. Legends, striping and markings not installed to ultimate design, and all speed limit marking shall be painted.
- "Leader" lines shall not be used in place of standard lane lines at intersections.
- Lane use arrows shall only be used in dedicated turn lanes or where movements allowed from a lane may not be clear to the driver.
- In turn lanes less than 100 feet in length, place one Type IV arrow at the back/beginning of the lane. In turn lanes 100 feet in length or more, place one Type IV arrow at the beginning of the lane and an additional arrow near the front of the lane.
- At intersections without crosswalks, the point where the striping is stopped for the intersection should normally be 10 feet behind half-delta.
- Crosswalks at locations with only one wheelchair ramp shall be designed to meet at half-delta. A 5 foot corner cutoff shall be used where a wheelchair ramp is present. At locations with two wheelchair ramps, the crosswalks should be centered on the ramps.
- Minimum lane widths are: Single left turn lane – 10 feet; Dual left turn lanes – 12 feet inside (#1 lane), 10 feet outside (#2 lane); Through lane against raised median with gutter – 14 feet; Through lane against raised median without gutter – 13 feet; Through lane against outer curb and gutter – 14 feet; Middle through lane – 12 feet; Right turn lane – 13 feet; Trap right turn lane – 14 feet.

- A trap lane shall be provided whenever a travel lane is forced to turn left or right at an intersection.
- When designing a trap lane from a travel lane, the channelizing line (8 inch white) shall be preceded by a minimum of 300 feet of 8 inch skip white (Caltrans Detail 37B). A Type IV arrow shall be placed at the beginning of the 8 inch skip white.

When designing left turn lanes:

- In a two-way-left-turn-lane do not use a reverse curve. Use a 50 foot gap between the end of the yellow line and the beginning of the 8" white line for a single left turn lane. For a dual left turn lane use a 100 foot gap.
- With a reverse curve, the end of the reverse curve should become tangent with the left edge of the turn pocket 25 feet before the beginning of the 8 inch white channelizing line. The length of the reverse curve bay taper shall not be less than 60 feet for a single left turn lane, and 120 feet for a dual left turn lane.
- The width of the bay taper shall be 75% of the width of the turn lane(s). The approach transition shall not be less than 100 feet.
- The length of the channelizing line (8 inch white) shall be a minimum of 50 feet and should normally be in 25 foot increments beyond that.

For divided roadways:

- Except at signalized intersections, install W6-1s "Divided Highway (Road)" and W6-2s "Divided Highway (Road) Ends" prior to the beginning and end of the divided roadway sections with raised medians. Install Type H reflective markers per Caltrans Detail 26 adjacent to the raised medians.
- Install R4-7s in the island nose only at the beginning of the raised median roadway section and at major intersections. On island noses without R4-7s install Type "K" markers.
- The entire curb face of an island nose separating directions of travel shall be painted yellow. White shall be used when the island divides traffic traveling in the same direction.
- Install R6-1(Rt)s "One Way" on all island noses and in the median across from major driveways.
- Install Type V "Wrong Way Arrows" (per Caltrans Standard Plans) 100 feet apart in each approach lane at intersections with collector or arterial streets, and at minor "T" intersections without a median break. At other minor intersections install one Type V "Wrong Way Arrow" in each approach lane.
- At signalized intersections with pedestrian push button poles in the island, install signs a minimum of 3 feet behind the PPB post.
- On divided highways with three or more through lanes for a direction, install supplemental signing in the median. Lane drop, and merge warning signs need only be placed in the median if the inside lane is affected.

1.3 Traffic Signals Plans

The following standards shall be applied to all Traffic Signal Plans:

- The scale of the plan shall be 1" = 20'. One sheet per intersection is desired, schedules and notes will be accepted on a separate sheet when necessary.
- The drawing title shall describe the intersection where the drawing is for by listing the north/south street of the intersection first.
- Traffic signal and interconnect plans are identified by "G" drawing numbers.
- Installation of traffic signal interconnect conduit extending beyond the limits of any signal drawings for the same project may be accomplished by the use of a note describing the installation.
- Show utilities on all drawings.
- If applicable, indicate possible conflict with irrigation systems and corrective action by Contractor should damage occur.
- Indicate the assigned phase adjacent to all symbols shown on the plan for vehicular and pedestrian indications.
- Dimension all street and lane widths, and utility locations. Provide dimension between centerline and curb.
- In areas without sidewalk provide for the installation of such within the curb return area to the back side of the pole caps and across the front of the controller and service cabinets.
- When calling for new or modified striping, give dimensions, and color or applicable Caltrans detail number. When using thermoplastic legends and/or markings, use the term "install" (Install CALTRANS detail 38).
- Where signing and striping work is substantial and causes confusion when placed on the traffic signal plan, a separate 1" = 40' scale signing and striping plan shall be provided.
- On projects with separate striping plans, the signal plan shall reflect the signing and striping as it will be at the end of the project.
- All traffic signal installation or modification plans shall have the following schedules/tables provided for each location:
 - Pole schedule.
 - Conductor schedule.

Controller Unit Specifications:

- The proposed controller unit shall be compatible with any existing or future signal system designated for that area by the City. The controller unit shall be an Econolite ASC/3-2100.
- The controller cabinet shall be a Type "P" with the top of foundation 18 inches above finished grade.
- Controller cabinets shall be placed on the same corner as the service.
- The controller cabinet should be located as close as practicable to provide the following:
 - Located on an approach leg to the intersection.
 - Location not vulnerable to traffic.
 - Traffic movements at the intersection are visible and unobstructed by physical features.
 - Possible to park a maintenance truck close to the cabinet.
 - Sidewalks, wheelchair ramps, store entrances, etc., are not obstructed.
 - It should not obstruct pedestrian or driver visibility standards.

Traffic Signal Standards:

- Median installations of traffic signal standards other than pedestrian push button posts should be avoided.
- Where a standard must be located in a median, the median should be at least 5 feet wide. The standard should include a pedestrian push button and should be set 2 feet behind the nose or the pedestrian aperture on the median.
- Signal poles adjacent to a divided arterial street shall have a 35 foot shaft and a 15 foot luminaire arm. All other poles other than 1-A poles shall have a 30 foot shaft with a 12 foot luminaire arm. 1-A poles for use with five section signal heads shall have a height of 15 feet.
- Signal pole locations shall be designed to provide a 5 foot setback from curb face to center of pole.
- Signal poles, mast arms and equipment shall be designed for maximum case arm loading and 100 mph wind velocity.
- When installing a pole on a foundation for a future pole with a different bolt pattern, use a standard pole with an adaptor plate rather than a pole with a modified base plate.

Traffic Signal Conductors

- Where new conductors are to be added to existing conduit, any existing conductors with THHN or THWN insulation should be replaced. Existing conductors with types of insulation other than THHN or THWN should be examined to see whether they should be replaced.

- Signal cable shall be used on all new installations and for modifications where all the control conductors to a pole shall be replaced.
- Signal cables shall not be spliced or looped. Signal cables shall be provided to each pole in the following manner; one 3 conductor cable for the pedestrian push button; one 5 conductor cable for the pedestrian indications; and either one 12 conductor cable for vehicle indications with overlaps, or a 9 conductor cable for all others.
- The conductor schedule for signal modifications shall be based upon the actual conductors existing at the time of the design and not upon the conductor schedule of the plan used for the construction.
- Safety lighting and internally illuminated street name sign (if applicable) conductors shall not be looped through the controller cabinet.
- Use minimum #10 A.W.G. conductors for safety lighting and signal commons, and #12 A.W.G. conductors for illuminated street names (if applicable).
- Interconnect Cable (IC) shall be a minimum 12-pair of #19 AWG, REA PE 22 cable.
- Splices in interconnect cable are not permitted.
- Where possible interconnect cable may be run in advance detector conduits.

Traffic Signal Conduit

- There shall be at least two 3 inch conduits entering a controller cabinet.
- Maximum allowable conduit fill is 28% for new conduits and 35% for existing conduits.
- For modification projects, all existing conduits should be examined to see if they need replacement.
- The possible location of bore pits should be considered when planning the location of conduit runs.
- Minimum new conduit sizes shall be 2 inch for advance detectors without interconnect, and 3 inch for all others including interconnect runs.
- Interconnect conduit is to be run adjacent to signal conduits so as to share the same trench.
- Interconnect conduit shall enter a separate #6E pull box adjacent to the controller cabinet prior to entering the cabinet.

Traffic Signal Pull Boxes:

- Pull boxes should be #5 minimum.
- Pull boxes to be installed in unimproved areas, including unimproved areas behind a curb, shall be traffic rated and shall have a pull box marker installed adjacent to the pull box.

- A minimum #6E pull box shall be used in all interconnect runs.
- A #6 pull box should be used:
 - At the end of EACH signal conduit exiting the controller cabinet;
 - When four or more conduits enter the pull box; and
 - Adjacent to mast arm poles.
- Pull boxes should not be placed:
 - In painted medians (except where a raised median is planned);
 - In paved shoulder;
 - In the traveled way; and
 - In the boundaries of a wheel chair ramp.

Vehicle Detection

- Vehicle detection for all new traffic signal installations shall be accomplished through the use of inductive loops. Modifications of existing traffic signals using machine vision may be required to convert to inductive loops.
- Limit line loops for through lanes should be 6 foot X 6 foot with 10 feet between adjacent loops in the same lane. Front loops shall not extend more than 1 foot into the crosswalk or limit line. Dimension advance detection from crosswalk or limit line.
- Provide three 6 foot X 6 foot loops in left turn lanes. Use a spacing of 10 feet and 45 feet between loops where approach speeds are 40 mph or less. Use a spacing of 10 feet and 55 feet between loops where approach speeds are 45 mph or more. Use a separate detector channel for the back or advance loop in each left turn lane.
- Badly damaged pavement shall be identified to be replaced before installing loop detectors.
- The designation used on the plan to identify a set of loops shall be the detection input to controller.
- Assign the detector loop sets or areas of video detection to controller detector inputs as follows, where there are three or more lanes for a direction, assign the front presence loops to inputs 1 through 8, and assign the back presence loops to inputs 17 through 24:

Detection Area	Input	Detection Area	Input
Southbound left turn presence	1	Ø1-Back Presence	17
Northbound through presence	2	Ø2-Back Presence	18
Westbound left turn presence	3	Ø3-Back Presence	19
Eastbound through presence	4	Ø4-Back Presence	20
Northbound left turn presence	5	Ø5-Back Presence	21
Southbound through presence	6	Ø6-Back Presence	22
Eastbound left turn presence	7	Ø7-Back Presence	23
Westbound through presence	8	Ø8-Back Presence	24
Southbound left turn advance	9	Ø1-Count	25
Northbound through advance	10	Ø2-Count	26
Westbound left turn advance	11	Ø3-Count	27
Eastbound through advance	12	Ø4-Count	28
Northbound left turn advance	3	Ø5-Count	29
Southbound through advance	14	Ø6-Count	30
Eastbound left turn advance	15	Ø7-Count	31
Westbound through advance	16	Ø8-Count	32

- Advanced detection should be provided on all approaches to an intersection and should be located as follows (for speeds between the values shown, use the next highest value):

APPROACH SPEED (MPH)	DISTANCE OF ADVANCE DETECTOR FROM LIMIT LINE (FT)
35	180' (Minimum Distance)
40	210'
45	235'
50	260'
55	285'

- Approach speed is the posted speed limit or the current 85th percentile speed of the approaching traffic, whichever is greater. For new intersections use the ultimate design speed.

Emergency Vehicle Preemption

- Install Opticom model 722 optical detectors and model 138 detector cables in all new and modified traffic signals. Install one optical detector for each direction of a divided arterial. Depending on the roadway geometry other roadway classifications may use a single optical detector on the signal pole nearest the controller cabinet. Consideration should be given to curves in the roadway.

Traffic Signal Modifications

- On modification plans, show design or model numbers for all existing special poles, especially concrete, where such information exists on City drawings or can be obtained in the field.

- Modify or replace existing pedestrian indications and p.p.b. signs to comply with Special Provisions (i.e. convert to Caltrans Type A with International Symbols.)
- Call for installation of backplates where none exist. In some cases this will require modification of existing signal mounting hardware.
- In pole schedules on modification plans, provide notes/remarks indicating: (E) existing to remain, (N) new equipment or pole, (R) relocate equipment to new pole or pole to new location, (M) modify existing. If appropriate, note if all are existing or new.
- Where installing additional or new indications on existing poles, call for either new installation, replacement, or modification of signal mounting hardware; not two or more choices. The designer should make the choice based on present condition of equipment and/or ease of or cost of modifications.

Utility Clearance

- It is the design engineer's responsibility to ascertain and provide for the minimum clearance requirements between the signal or lighting equipment and overhead utility lines, utility poles, and railroad tracks.

Traffic Signal Service

- The service enclosure should be located a minimum of 10 feet from the controller cabinet.
- New services shall be Type III-CF and shall be placed so as not to require a street crossing between the Edison service point with the first plan submittal to the City. The cabinet shall include an integrated battery back-up system that will allow for the containment of the inverter, batteries and necessary equipment.
- Call for modification of existing service when adding circuits (even if future) for luminaires and IISNS (if applicable).
- Provide separate lighting circuit and 30 amp breaker for each 1200 watts or portion thereof.
- Provide correct number of conductors in service runs for each circuit in the service.

Vehicle Signal Heads

- All indications shall be 12 inches. When distance from the limit line to the indications controlling that movement exceeds 150 feet, provide near, right side indications.
- Mastarm mounted signal faces should be at least 70 feet from the limit line.
- All vehicle signal faces shall have backplates.
- All side mounted heads (vehicular and pedestrian) shall have terminal compartments.
- Left turn signal faces should consist of conventional 12 inch red arrow, yellow arrow, and green arrow sections. The designer shall revamp signing when an

- existing left turn signal face with green arrow, circular yellow and red lenses is to be replaced with an all arrow signal face.
- Use MAS mounting for all mast arm mounted indications.
 - When the number of through lanes exceeds two, provide two mastarm through signal faces located as close as practicable to the following:
 - One face in line with the lane stripe between the #1 and #2 through lanes, and one face in line with the lane stripe between the #2 and #3 through lanes for a 3-lane approach.
 - One face in line with the lane stripe between the #1 and #2 through lanes, and one face in line with the lane stripe between the #3 and #4 through lanes for a 4-lane approach.
 - Normally, mastarm left turn signal faces should be located as close as practicable to the following:
 - One face in line with but no further out than the center of a one lane left turn approach.
 - One face in line with the stripe between the 2 lanes of a 2-lane left turn approach.

Pedestrian Signal Heads

- Pedestrian signal heads should be located where there is minimum visibility interference from vehicles stopped at the crosswalk or limit line.

Phase Diagram

- A phase diagram shall be provided only when nonstandard phasing is used.

Conductor and Conduit Schedule

- A conductor and conduit schedule shall be provided for all signal plans, preferably on the same sheet as the signal plan. Use numbers inside triangles to designate conductor runs.
- In the conductor schedule, number the conduit runs from the end of one leg to the end of the other leg so that the conduit runs into the controller cabinet are in the middle of the schedule. Each 3 inch conduit entering the cabinet should be considered a separate run. Do not number conduit runs between signal poles and adjacent pull box.

Pole and Equipment Schedule

- A pole and equipment schedule shall be provided for all signal plans, preferably on the same sheet as the signal plan. Use letters inside circles to designate poles. Do not show a pole location detail or dimensions for pole locations. All actual pole locations shall be determined by the City staff at the time of construction.

Railroad Pre-Emption

- A five conductor signal cable shall be provided between traffic signal controller cabinet and the railroad crossing cabinet. Arrangement shall be made with the railroad company to provide contact closure from the railroad crossing cabinet to the traffic signal controller cabinet.

Pedestrian Push Buttons and Posts

- At corners:
 - PPB's that are to be mounted on a signal standard should be within 5 feet of the crosswalk (or where a marked crosswalk will be if it has not yet been installed). If the signal standard cannot be located in this area, a separate PPB post should be installed.
- In medians:

PPB's should not be installed in raised medians narrower than 4 feet. PPB's placed on a raised median should be 2 feet behind the nose or the pedestrian aperture on the median. Traffic signs shall not be mounted on the PPB post.

Provide for installation of R9-3a signs where marked crosswalks are not provided and pedestrian crossing is not desired.

Where possible, call for striping changes or better pole locations rather than installing pedestrian push button posts.

When showing PPB posts, use correct Caltrans symbol.

Intersection Lighting

- Safety lighting circuits and internally illuminated street name sign circuits (if applicable) shall be independent of each other and of street lighting circuits.
- Cutoff type, 250 watt high pressure sodium vapor luminaires shall be used for intersection lighting. Intersection lighting circuits and internally illuminated street name sign circuits (if applicable) shall be 120 volt.

1.4 Street Lights Plans

The following standards shall be applied to all Street Light Plans:

- The scale of the plan shall be 1" = 40' or 1" = 20'. The drawing title shall describe the location where the drawing is by listing the major street first and then the cross streets.
- Street Light plans are identified by "L- " drawing numbers.
- Show utilities on all street light plans.
- If applicable, indicate possible conflict with irrigation systems and corrective action by Contractor should damage occur.
- Where Street Light improvements exist or are proposed on private property (behind ROW line), indicate existence of or need for encroachment and maintenance easements. Appropriate easements must be provided prior to

- approval of plans for private developments. On City projects, coordinate acquisition with City personnel.
- Dimension all street and lane widths and utility locations. Provide dimension between centerline and curb.
 - In areas without sidewalk provide for the installation of such within the curb return area to the back side of the pole caps and across the front of the service cabinets.
 - Street light standards, mast arms and equipment shall be designed for maximum case arm loading of 100 mph wind velocity.
 - It is the design engineer's responsibility to ascertain and provide for the minimum clearance requirements between the lighting equipment and overhead utility lines, utility poles, and railroad tracks. Engineer shall obtain approval from Edison for overhead clearance per CAL/OSHA Electrical Safety Order 2946 with a minimum clearance of 10 feet from overhead high voltage lines and street lights.
 - Provide separate lighting circuit and 30 amp, 240 V breakers for each direction or portion thereof from the service with a minimum of 4 circuits.
 - Provide correct number of conductors in service runs for each circuit in the service with a #5 pull box in front of the service per the City Std. Dwg. 5105 and 5106.
 - The owner shall be responsible for all costs associated with the operation and maintenance of the street lighting/traffic signal facilities and appurtenances. A signed Consent and Waiver annexation form to the appropriate Landscape and Lighting Districts shall be filed with the City Engineer's office. This form and applicable fee can be obtained from the Engineering Department's Assessment and Consulting Services section by contacting General Services at (909) 395-2016.
 - This form shall be fully executed, notarized by all the record owner(s) of the property, and recorded with the San Bernardino County Recorder's office. This original recorded document and a copy shall be submitted to the City Engineer's office, Engineering Services/Land Development Section, prior to the issuance of a building permit or final approval of the subdivision map, whichever occurs first, along with the payment of the applicable fee for annexing the property to the appropriate District.

Location of Street Lights

- Intersections:
 - Two minimum on local residential and industrial intersections;
 - Four, one each on opposite corners, where one of the streets has a curb separation of 64 feet or greater.
- Between intersections with staggered spacing as follows:
 - Local residential curb separation 40 feet or less, 130 feet \pm 15 feet;

- Local industrial curb separation 48 feet or less, 180 feet \pm 15 feet;
- Collector street curb separation 64 feet or less, 160 feet \pm 15 feet;
- Standard arterial curb separation 76 feet or less, 122 feet \pm 15 feet;
- Divided arterial curb separation 94 feet or less, 170 feet \pm 15 feet opposed;
- Divided arterial curb separation 128 feet or less, 120 feet \pm 15 feet opposed.
- Attempt to place near lot lines, but allow clear sight distances for survey ties.
- Sharp curves, steep hills and other street conditions as deemed necessary by City Engineer.
- Alleys, where warranted by extreme situations resulting in severe problems.

Street Light Type

<i>CURB SEPARATION</i>	<i>LAND USE</i>	<i>LAMP TYPE</i>	<i>POLE TYPE*</i>
0 – 40'	Residential	70W, HPS	B
0 – 48'	Commercial	100W, HPS	A
>40' – 64'≤	All	150W, HPS	C
>64' – 76'	All	250W, HPS	C
76' – 94	All	250W, HPS	C
Divided Highway	Other	250-400W, HPS	C or Other
0 – 48'	Residential	100W, HPS	KING
40' – 64'	Commercial	150W, HPS	KING

* Per Standard Drawings 5101 through 5106

Installation Required of Developers

- Mandatory for all subdivisions and developments requiring a building permit in accordance with Sections A & B, except:
 - Remodels and additions less than 25% of the existing structures, where no street improvements are required but shall pay an in-lieu fee for a portion of a street light.
 - Existing Edison lights shall be replaced with City standard lights.