



Agenda – Street Light Committee

May 27, 2010

10:00 AM

1. Call to Order
2. Pledge of Allegiance
3. Approval of April Meeting Minutes
4. Agency Input on Definition of “Public Safety”
5. Sample Street Light Policies
6. Street Light Improvement District Process
7. LED Light Fixtures - Seesmart LED Products
8. Agenda items for next meeting
9. Public Comment
10. Adjournment

ITEM 3

SANTA CRUZ COUNTY
Street Light Committee

Minutes of Meeting
April 22, 2010
10:00 A.M.

Persons present at the time the meeting was called to order: Scott J. Altherr, Public Works Director, Dan Doyle, Armando Lopez, Marcelino Varona, Pablo Ramos, Assessor's Chief Deputy, Edgardo Madril, Lois Cooper, Blaine Moyer, and Angie Pimienta.

Not present were Jim Ross and Joanne Notorfrancesco and there were no members of the public in attendance during the meeting.

Meeting was called to order at approximately 10:09 A.M., by Mr. Scott J. Altherr, of the second Street Light Committee, once a quorum was present.

Second on the agenda was appointment of Mr. Dan Doyle as chairman of the Street Light Committee.

Marcelino Varona made a motion to appoint Mr. Doyle as chairman of the Street Light Committee.

Blaine Moyers seconded the motion.

Mr. Scott Altherr called for discussion of the motion. No discussion occurred and a vote of Mr. Varona's motion to appoint Mr. Dan Doyle as chairman of the Street Light Committee was taken.

The group all voted yes, the motion carried unanimously.

Marcelino Varona requested to know why the Pledge of Allegiance was not on the agenda.

Mr. Doyle requested that the committee members perform the Pledge of Allegiance and that Mr. Varona lead the Pledge.

Chairman Doyle moved to the Item #3 of the agenda, approval of the minutes for the March 25, 2010 meeting.

Armando Lopez made the motion to approve the March 25th, 2010 minutes as they were.

Pablo Ramos seconded the motion.

Chairman Doyle called for discussion of the motion. No discussion occurred. A vote of Mr. Lopez' motion to was taken to approve the March 25th, 2010 minutes.

The group all voted yes, the motion carried unanimously.

Chairman Doyle moved onto Item #4 of the agenda – Staff Inventory of Street Light in regards to Direction of Illumination.

Mr. Altherr stated that out of the 878 light in the inventory that the committee is responsible for. The committee had previously requested to know how many of those street lights were pointing at driveways, side yard or rear yards. During the initial investigation of the street lights, the directional illumination of the street lights was not a criteria factor that had been studied. Staff took a random sample of approximately 191 street lights of the 878 lights. Of those lights sampled, staff was unable to find a street light facing driveways, front yards, side yards or rear yards. However, staff did find several street lights that were facing driveways, front yards, side yards or rear yards; however, none of these lights were on the County inventory of street lights. As a result of the random sample staff feels confident that there are no street lights that are facing driveways, front yards, side yards or rear yards.

Marcelino Varona stated that although the sample was ample, that without checking all the street lights in question, there is always a small chance, that there might be one or two lights that fit the directional illumination criteria.

Pablo Ramos asked when the street light issue arose, was the directional illumination even considered a factor.

Scott Altherr replied that directional illumination was not a criterion that was taken into account during the street light recommendation to the Board of Supervisors.

Marcelino Varona stated even though we had done a random sample taken it is only an inference as to the finding and not conclusive findings.

Blaine Moyers stated that there are several lights pointing into the street area, but there some that are pointing into private citizens' driveways, front yards, side yards or rear yards.

Armando Lopez state that some lights are pointing onto private property and he had asked some of these citizens who was paying for the street light and found that these citizens' were paying for their street light. Are we going to disconnect those street lights?

Lois Cooper stated that when she first moved in to her residence, UniSource asked her if she wanted a street light installed. Kathy Campaña on the other hand asked UniSource if she could take over payments on the street light by her residence that is on the list of lights that Public Works is recommended be turned off. However, UniSource asked to check with the County, because it is a County light.

Scott Altherr stated that he had contacted UniSource to clarify the issues, since the light is not on Public Works list of street lights that will be covered under HURF funds.

Blaine Moyers stated that just because a street light has not been identified as falling into the directional illumination category currently, a policy should be set for future street light installations. Or if the problem is found after the street light policy is conceived, a mechanism should be in place to address the issue.

Scott Altherr stated that the task of the street light committee is to make a recommendation to the Board of Supervisors on the current 878 street lights that are currently being funded by the general fund. Not to address the addition of new street lights. A policy needs to be set by the committee to include what type of criteria to use to define public safety. Public Works staff has already addressed the issue with traffic concerns. What is public safety? That is the question that the committee has to define in order to proceed with the development of criteria. Then and only then can the street light committee make recommendations on a street light policy that provides guidance for current street lights and for future street light requests.

Blaine Moyers stated if a request for a new street light came in for a school bus stop, the light might only be use 1 or 2-years only, since school bus stops are not a permanent due to fluctuation in population and the unpredictability of human nature to stay put in one place. Since school bus stops change over time, we should have the school district commit to the stop as permanent or cost share.

Lois Cooper stated that staff needs to draft a policy for the implementation of street lights for school bus stops. That staff contact the Transportation departments of the various districts to before making a recommendation on a street light.

Marcelino Varona stated that the county should not have to pay for street lights that illuminate school bus stops. The districts have funding that can be utilized to hire consultants. The consultants will make the determinations of placement, if a street light is warranted or not. Place the responsibility and burden back on the school districts, it is their responsibility.

Dan Doyle stated that it sounded like you want to shut off all the street lights and make it someone else's problem.

Scott Altherr stated keep in mind that only 25% of the street lights currently are being funded by HURF funds the rest of the street lights are being paid for by the general fund. Currently the general fund is hurting and is not in a very good shape.

Dan Doyle stated if we come up with a policy or maybe just a semi policy that has an inclusion clause that states that all street lights that meet the criteria, HURF funds must fund them.

Scott Altherr stated that during the initial investigation of the street lights, it was discovered that only 25% of the street lights meet a criteria that was developed by staff that took into account factors such as geometric design, intersections, traffic accident data, traffic counts and visual inspections that defined whether not a street light met the criteria under HURF funding. However, the Chairman of the Board of Supervisors made the request that a public safety issue was at stake and that questions needed to be answered before the issue could proceed.

Armando Lopez stated that he has spoken to several persons and that they don't want their street lights being turned off.

Marcelino Varona stated they if they want the street lights on then they need to pay for them, other than that we need start turning off street lights. As a committee we need to start thinking about forming a district. What the Board did is to turn a street light issue into a political issue. We need to recommend that the street lights issue be turned into a street light district and then let the public decide if they want to pay for street lights or not by voting for it or not. Let the people decide.

Scott Altherr stated that when the issue of street lights first came up, we met with UniSource to inquire as to the logistic of turning off street lights. We collaborated in identifying all the street lights first, since we only get a bill without any type of location information. Then we asked what would this task entail? How would these street lights be turned off? UniSource stated that they would not be removing the fixtures, that component would stay. They would only be turning off the light bulbs. They stated since they would be leaving the fixtures behind, and if in the future the resident requested a street light, they would not have to go back and reinstall the equipment. But their staff would notify the home owner nearest the street light that the light was

being turned off. Staff also asked UniSource if a flyer could be added to their invoice mail out, giving residents advance notice of the upcoming event. UniSource stated that they could not add a flier to their invoices, because the mailer would go out to several other communities not just the identified area.

Blaine Moyers stated that there is a mechanism under which UniSource could have sent the flyers to only the desired location; they just don't want to go through the process.

Armando Lopez stated that everyone located in those regions would appreciate notice, that would give them time to make up their minds about paying for street light or not.

Marcelino Varona stated that they do have a mechanism in place, because clearly when they do price rate notice, the information is placed into the invoices.

Lois Cooper stated that she felt there is a time constraint to do a vote on the street light issues and to have something done for the Board in a rush, without really addressing all the avenues, she felt uncomfortable just doing a rush job.

Scott Altherr stated that he has road committee that has been advocating a road improvement district, where 51% of the residents would have to agree to the improvement before proceeding to the County. This action would require the residents to initiate the process not the county. The County cannot do it for them. They need to have their own leaders to represent them.

Blaine Moyer stated that he just went through a similar process with stated Fire Districts – due to state law, the process entailed that the election could not be a special election and it had to be a regular election, which meant that they had to wait for the general election to come around. With only 1% of the registered voters actually having to vote, made it easy to pass, due to the poor turnout for elections. Then they had to certify each and every vote that came in, and that took some time. Like any new law, we had to wait for an x-number of days before it became effective. The process took time, but it was worth it in the end. I think we need something similar to this for our street lights.

Scott Altherr stated to Mr. Moyer, you are right and there is a mechanism in place. Cochise County has been struggling with the formation of a road district for years, the up-front costs including legal services, etc. is significant enough that there is a break even threshold at which you want to make sure your costs are in line with. Then the second issue that you will have to think about is – if everyone pays into the district, then everyone will want a street light. There are also upfront costs associated with a streetlight installations, but as you know these would be significantly less than if it were a road improvement. Road construction costs could run \$1.3 million per mile but streetlight infrastructure would be significantly less.

Marcelino Varona asked what it would take and how is a street lighting district formed? Can you (Scott) bring us examples of ones that have been done in other communities? How are they managed?

Scott Altherr stated that there is a threshold in infrastructure costs at which point you can justify the up-front formation costs such as attorney's fees and administration, that specific type of information I can bring to the table. These are all good ideas, but we still have no policy for street lights in the unincorporated areas of Santa Cruz County, much less for new street lights. The committee has still not discussed the information from the Sheriff's Department item and School Bus Stop information that was identified. We keep coming back to our original question that out of the 879 street lights which do not meet a valid criteria identified by this group, does the Board of Supervisors continue to fund these lights. Or will this group establish criteria where the Public can help address this task at hand. We need to look at all of these ideas. Then the committee can make a recommendation to the Board of Supervisors by May for utilization in the Budget.

Blaine Moyer stated that this budget crisis is very bad. We need to start working together to make sure we have a new policy in place for future public needs. And secondly, we need to let people know if you do want street lights then form an improvement district or you can pay for your street lights. The committee is not here to find a funding source for the Board of Supervisors. And it is their way of saying to the public, we did not turn off the lights, they did. The people should have a choice, they can form a district and pay taxes or they can do it themselves.

Marcelino Varona stated what is public safety? HURF is based on State statutes and that defines how funds are allocated. This is our policy, we need to make it. Do we have a sample street light policy from other counties that we can look at?

Scott Altherr stated that Pima County has 800 HURF funded street lights in their county that are located primarily at intersections. The remainders of the street lights are paid for with funds from lighting districts that are self-imposed tax by the people. With respect to public safety, when this issue first came up and the Board asked me to define public safety for them. I told them that I am a professional engineer. I do not do public safety; I am not qualified to make that determination. I don't have the information to define what public safety is, it is a broad term that every individual can answer differently with respect to their life experience and situation. I simply cannot answer that question for everyone.

Marcelino Varona stated that public safety is a generic term that the committee needs to define. Once defining the term it will be easier to establish a policy. But the information concerning the

crime rates in the County was not very helpful reading. It has no definable areas to use a criterion to base some of the issues that have to be addressed.

Angie Pimienta stated that the information that was given by the Sheriff's department was straight from their data bases that are in turn used for statistical purposes only for their reports to federal government. The reports themselves do not give individual street locations, other than a quadrant that the Sheriff's department has determined – but that information was not given to us. The reports were based on what they term misdemeanor offense which was defined as being theft, burglary, grand theft autos, arson, possession of narcotics, recovered stolen property, etc. Then felony offenses which were defined as homicides, assaults w/weapons or force, robbery, rape, etc. However, after reviewing the data, I asked the people who know, the dispatchers, where the true hot spots are in the County. I was advised that Estates 11 and Villa 16 (exit 12 area) all of Ruby Road to the end at where all the street with the surnames are located. Then from South Pendleton Drive all the way up to Rio Rico Drive, to include all those street on the east of Pendleton Drive. Then once you cross over the interstate, starting from Urban Unit 7 Circulo Mercado and surrounding homes to the west all the way up to the end of the West Frontage Road, to include all of Villas 13 area.

Scott Altherr stated, Angie please place all that information on a Memo to the Street Light Committee for the next meeting.

Marcelino Varona stated can you get policies from other counties? Do you know other counties that have street light policies in effect now other than Pima County?

Lois Cooper stated I have several issues with the Villas 13 area, besides that fact that they seem to have several street lights in that area, almost one at every house. The roads are all cut up with several open trenches on them. Then the area has some of the worst placement of mail boxes...

Blaine Moyer stated that in this budget crisis – maybe eliminating street lights at mail boxes, would be one way to cut back on street lights. Mail boxes should not have to have a street light. As far as street lights providing safety for streets, well I found out some years ago at a curve near my residence on Camino Ramanonte 4-5 vehicle went off the curve. But once the County installed reflective arrows instead of a street light, the accidents subsided, and the problem was solved. We are better off with less lights then having street lights that face people's homes.

Marcelino Varona I don't see why we cannot find why we need to have so many street lights. Why can't the County find funds to pay for all of street lights?

Scott Altherr stated that out of the 1164 street lights in total, only 284 street lights currently qualify under HURF funding, because they are meeting a defined criteria by Public Works. The

rest of the street lights 880 do not meet the criteria set by Public works and thus cannot be legally paid by the HURF fund.

Armando Lopez stated that I don't want to see people walking on the edge of the roadway that now have street lights, to all of a sudden be turned off. This is one of my concerns; several persons that I know are worried that this is what we are going to do, just turn all the street lights off. That is not what I signed up for here.

Dan Doyle stated do you want to Scott to find a policy on street lights?

Marcelino Varona stated I make a motion that Public Works look for and bring to this committee other street light policies from other jurisdictions.

Blaine Moyer stated that he seconded the motion.

Dan Doyle requested any discussion on the matter?

Marcelino Varona stated I don't want to make the decision for the Board of Supervisors on what lights should stay on or off. I want to make a recommendation to them that includes a policy for today's dilemma and criteria for tomorrow, the more we put in writing the less chances are that there will be back lash against the policy.

Dan Doyle called for a vote of group.

The group all voted yes, the motion carried unanimously.

Marcelino Varona stated we need to look at the criteria that have been given to us, we need to ask, where does gangs activity happen the most, look at....

Edgardo Madril stated that no school bus stops street lights should be kept, as they school bus stops change every year. What are we going to cut this light here and put it over there?

Pablo Ramos stated that street lights could also be a place where gangs can congregate under, instead of keeping them away.

Blaine Moyer stated that street lights could be a place to collect bad seeds in the area.

Edgardo Madril stated that all these issues all go back to Rio Rico. Let's ask the Rio Rico community what they want to they want us to turn off all the street lights? Or do we make the decision for them. I am not comfortable with just turning off the street lights. Yes, we need to

make a decision, but what are we basing it on, the cost, what lights cost the most, where are they? Does UniSource depend on maintenance agreements from the County? How much do we pay on that?

Scott Altherr stated that the street lights costs, depending on a number of varying factors, such as wattage. The higher the wattage, the more expensive the street lights. If the street light has underground service or over head service, that is also a varying factor.

Edgardo Madril stated that Frontage Road area is very populated but there were not that many street lights in that area.

Scott Altherr stated that staff looked at looked at several factors before making the determinations on the street lights. When comparing our County to other locations one could compare Pendleton Drive and the West Frontage Road to other rural area of our size, such as Sahuarita Road and Tangerine Road. In regards to the volume of traffic, our road have street lights, and these road have no street lights, and they are more populated and more traveled than ours. When making the determination on street lights, staff based the decision on what purpose it served. We looked at intersections and determined that we could keep these, because they were serving a purpose. But just as easily we could have turned them off. However, we added to our list of factors, if there is a doubt, to go ahead and keep it in our inventory of street lights.

Marcelino Varona asked if any of the street lights that are currently being paid by the County in the City of Nogales, since the City does fall in the County. Or is it only the rural areas?

Edgardo Madril stated only County.

Marcelino Varona stated so some of the street lights are paid for by HURF funds, some are paid by General fund. In the old days, Mr. Doyle probably got the same calls, when we were Mayor of the City of Nogales, we get a call and the next thing is that a street light went up. I am sure this happened to you Mr. Chairman.

Scott Altherr stated that there is a difference between an urban setting like the City and a rural setting in the County. For instance an urban setting you have more pedestrian traffic and movement on City sidewalks. That is to be expected in an urban environment. We did not use the City of Tucson as a model, because it is an urban setting.

Dan Doyle asked Mr. Madril if he had a motion on his point.

Edgardo Madril stated that he would like to see the bill from UniSource Energy Services for the street lights with the break down in payment. Mr. Madril also requested to know how many bus stops had a street light currently.

Blaine Moyer stated is this going to place a time constraint on the issue of street lights.

Lois Cooper stated that all recommendation is going to have to be based on public safety comments on urban verses rural settings. Our schools have tracked to walk on – that is safer than walking along a road. We should all look at the memo from Walter it sums up all the bus stops with street lights on them.

Marcelino Varona stated that we can discuss urban verses rural areas, but even in our own rural setting there is a great deal of difference between Sonoita and Rio Rico.

Lois Cooper state there is a difference with street light ordinance and a street light policy.

Blaine Moyer stated during his experience with that pathway committee even on the construction of screening walls there was a heated debated about why or why not to install screening walls. Somehow in this committee, it is a different feeling, and it is not that easy to define public safety. I grew up in Ohio and when I got up in the morning to go to school and when I came home in the afternoon from school it was dark. So when you get dropped off – get home.

Pablo Ramos stated that there is a difference now than back then. What 40-years ago?

Scott Altherr stated that I want to move back – I heard someone say public safety. We came here to define public safety. The only thing he’s heard is that “mail boxes” are not a public safety issue. I am not hearing any motions on the definition of public safety.

Pablo Ramos stated I want you all to come to where I live. Go by the mail boxes and all you can see, from where I live are the burlap bags used for marijuana.

Lois Cooper stated no, we should not base our decisions for lights on safety. If you were to go to Camino Josefina/Pendleton Drive there are no lights those areas and there are several mailboxes in these areas.

Blaine Moyer stated that there were no need for street lights on Camino Ramanote/Calle Tubutana, all they needed was the right signage to take care of the problem. If there is a street light, it should not be for mail boxes, that’s why you have head lights on your car for.

Edgardo Madril started that maybe the Post Office should consider paying for street lights at mail boxes, they put those boxes there.

Pablo Ramos asked to know if there is a difference in the way HURF funds defines a rural area and an urban area when it comes to street lights.

Scott Altherr stated that pedestrian and vehicular traffic conflict, since there are more accidents in an urban setting. At this point in time, we do not have that specific data.

Marcelino Varona stated, Scott you have no definitions? You have made statement that can apply. Making generic statements – you need more flexibility. In this area A x applies and in area B y applies.

Scott Altherr stated that he needed the committee to define public safety. Once defining public safety, a policy can be made to deal with traffic issues as well. But the committee needs to define public safety and what are the criteria for them to establish/base their decisions on.

Blaine Moyer stated the question for the Sheriff's Office is to ask the patrol where they want street lights at.

Scott Altherr stated that after Public Works had developed the criteria for the street lights, they Sheriff's Department for their input. But if we left it up them, they want all the street lights stay.

Angie Pimienta stated, although we gathered information from the Sheriff's Department and as you saw, it was hard on the eyes. But they too have programs such as the Neighborhood Watch program that Sgt Jerry Maldonado runs, and they do not advertise, because they do not have the funding. Additionally, you need to take into consideration other factors as well. For example, street lights hamper the use of night vision equipment at night.

Lois Cooper stated could we get Jerry Maldonado to define public safety?

Edgardo Madril stated what if we get a definition from the Sheriff's as to what they think is public safety.

Marcelino Varona stated we can look at all these definitions. We can look at how ADOT defines street lights. Here again is it for you (Scott) to mold it in such a way that it is broad enough to encompass what we are trying to do here.

Scott Altherr stated ADOT goes by ASHTO and only places street lights on interchanges. You can drive on 1-19 for miles and not come to any street lights until you get to Pima Mine Road and then the next one is at the San Xavier exit.

Blaine Moyer stated we can have a policy with these factor incorporated into it.

Marcelino Varona stated have school district define school bus stops then let them pay for the street lights. We should get an IGA with all the school districts.

Blaine Moyers stated bus routes, not all of them are stable routes and the routes some times change annually.

Lois Cooper stated I like to make a motion that we get information from the Sheriff's department, the school districts, and have Public Works get that to us.

Dan Doyle state we have a motion on the table do I hear a second?

Blaine Moyer stated I second that motion.

Dan Doyle stated motion is open for discussion.

Blaine Moyer stated that we need those defining to make an informed decision.

Lois Cooper started that if you find more information from other places, such as ADOT, other communities in our area and of our size, and policies too.

Armando Lopez stated does border patrol need lights and can they help us pay for the street lights?

Marcelino Varona stated that he did not just want a bunch of definitions that he wants a policy for us to use.

Edgardo Madril stated can you make a guideline that defines what constitutes a street light in an urban area verses a rural area.

Blaine Moyer stated that there are several criteria that the committee has to look at and maybe not all apply, or have been thought of.

Pablo Ramos stated that here a chance to look at street lights and geometric design at the same time.

Dan Doyle called for a vote.

The group all voted yes, the motion carried unanimously.

Marcelino Varona stated that an he wants an agenda item for the next meeting – called for a light fixture to use efficient light fixture.

Blaine Moyer stated that the committee needs to keep in mind the dark skies.

Scott Altherr stated that we have sunrise and sunset information from AZ Game & Fish, and only two lights fall into that criteria. We need criteria to form a basis from.

Marcelino Varona stated why do we need to pay for street lights? If all that bus stops change every year.

Scott Altherr stated we need to ask the Sheriff Department, school bus routes...

Marcelino Varona stated bus stops are random in Rio Rico, if we ask them to be responsible, and for them to define what is public safety to them? Do you know if they are willing to move the bus stops if asked?

Lois Cooper stated the major intersections all have bus stops along them, maybe if we talk to the transportation depot staff. Some of these bus stops are not safe places, perhaps if we ask them what they use in considering a bus stop. How do they do it? Do they ask the road department for information on the road? Or do they just decide here is a good place for a bus stop. Do you have any traffic studies on the bus stops?

Marcelino Varona stated if they (SCVUSD #35) have studies can they give us copies of their information.

Edgardo Madril stated they have stops all along Pendleton Drive, and they stop at each intersection.

Lois Cooper stated we are asking SCVUSD #35 to tell us what is their definition of public safety?

Dan Doyle stated that will be on our next agenda and an action item.

Armando Lopez stated get a report from Border Patrol, have them define what is public safety, or maybe even someone from Border Patrol can be here, too.

Dan Doyle stated lets set the next meeting date.

Marcelino Varona stated May 27, 2010 @ 10:00 AM

Blaine Moyer stated can it be at the Rio Rico Fire Station, since we are dealing with Rio Rico.

Lois Cooper stated it would make it a little easier for all of us, since most of the group come in from Rio Rico.

Dan Doyle asked if Scott Altherr if he could look into setting up the meeting and then advising the group.

Scott Altherr stated that he would notify the group before the next meeting took place, if the Rio Rico Fire Station was a viable option.

Dan Doyle called for any Public Comment at this time?

Marcelino Varona stated if the meeting could be moved down to 9:00 AM instead of 10:00 AM

Lois Cooper stated I cannot, my schedule is based on the 10:00 AM time.

Mr. Doyle stated then adjourned the meeting having no comments, at 11:39 AM.

ITEM 4



TONY ESTRADA
SHERIFF

OFFICE OF THE SHERIFF
OF SANTA CRUZ COUNTY



RAMON A. ROMO
CHIEF DEPUTY

May 17, 2010

Director Scott J. Altherr, P.E., CFM
Public Works Department
2150 North Congress Drive
Nogales, Arizona 85621

RE: Santa Cruz County Street Light Committee

Dear Director Altherr,

With regard to the committee's request of our department's definition of "public safety", our office defines this as; the delivery of emergency and non-emergency services for the welfare and protection of the citizens of Santa Cruz County. The sheriff's office primary goal is the prevention and security of the public from the dangers affecting safety such as crimes or disasters while improving the quality of life through a community partnership.

Although the street lights alone will not stop crime from occurring it is a deterrent to those person(s) intent on violating the law or causing harm to others because it provides an opportunity to identify would be perpetrators, their vehicles or any form of illegal activity from happening. I hope this answers their question.

If I could be of further assistance, please do not hesitate to call upon me at, (520) 761-7869 extension #8113 or via e-mail at rfuentes@co.santa-cruz.az.us

Very Truly,

Captain Ruben F. Fuentes
Santa Cruz County Sheriff's Office

cc;
File

Scott J. Altherr

From: Bambi De La Riva [rdelariva@nUSD.k12.az.us]
Sent: Friday, May 21, 2010 9:37 AM
To: Scott J. Altherr
Subject: Street Light Input

Good morning Scott, for your information, all existing street lights I consider are necessary for the following reasons:

:

- 1.) They provide visibility in all the dark areas of the city and Rio Rico.
- 2.) Without the lights you would have a lot of vandalism and graffiti throughout the county.
- 3.) The most important thing is that without the street lights you would have a number of accidents possibly deaths.

If you are looking at the expense, you need to ask yourself, is it worth a life or the safety of our community in general. I think the answer to your dilemma regarding the expense of these lights is to look at the high efficiency energy saving lights that would cut your electric expense over 65%. There are companies that provide this type of low energy efficient lights. That is my opinion.

If you have questions or concerns, please call me at (520) 980-0401.

Thank you,

Ricardo de la Riva, Director

Support Services

Nogales Unified School District No. One

(520) 287-0920

(520) 980-0401 cell

Scott J. Altherr

From: Angie Pimienta
Sent: Monday, May 24, 2010 4:40 PM
To: Scott J. Altherr
Subject: FW: Request for Agency Input - Street Light Committee

From: Josephine Gallo [mailto:JGallo@santacruz.k12.az.us] On Behalf Of Carlos Robles
Sent: Monday, May 24, 2010 3:13 PM
To: Angie Pimienta
Subject: RE: Request for Agency Input - Street Light Committee

Hi Angie,

Here's the paragraph on Public Safety that you were looking for. If you need anything else, please let me know.

The encyclopedia states that:

“**Public safety** involves the [prevention](#) of and [protection](#) from events that could endanger the [safety](#) of the [general public](#) from significant [danger](#), [injury/harm](#), or [damage](#), such as [crimes](#) or disasters ([natural](#) or man-made).”

I completely concur with that definition, and as both a parent and a school administrator, I feel that the safety of our children comes first, and that the removal of the street lights will put them in danger. Our children often wait for the school bus in the early morning hours while it is still dark, and our after school activity bus also drops children off in the late afternoon/early evening hours. Rio Rico is still comprised of many open lots which become a haven, not only for wild animals, but also for undocumented aliens, drug traffickers, etc.

Thank you.

Josephine Gallo

Santa Cruz Valley USD #35

1374 W. Frontage Road

Rio Rico, AZ 85648

(520) 375-8260

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From: Angie Pimienta [mailto:apimienta@co.santa-cruz.az.us]
Sent: Thursday, May 20, 2010 6:10 PM
To: Carlos Robles
Subject: Request for Agency Input - Street Light Committee

Hello Mr. Robles;

We have not heard back from you and wish to obtain either an email or a letter to our office.

The information will be used by the Street Light Committee in making a determination on defining **PUBLIC SAFETY**.

The Street Light Committee will be meeting on Thursday, May 27, 2010 @ 10 AM at the Rio Rico Fire Station II, located at 957 Calle Calabasas, Rio Rico, Arizona 85648 (about 1-mile north of Exit 12 on the West Frontage Road).

Your reply will be greatly appreciated.

ITEM 5

Manual No **T 3203**

Division No **PPG-16-0-0**

MCDOT POLICY / PROCEDURE MANUAL

Type **Procedure** Part of Another Document **YES**

Title **Street Lighting**

Statement
Traffic Engineering has established a uniform policy for the installation of street lights along roads or at intersections under the jurisdiction of Maricopa County. Roads or intersections may get street lighting through one of these methods: Street Light Improvement District (SLID); Private Lighting Agreement; Signalized Intersections; or Night Accident History.

Category **Design - Design Levels**

Division **Traffic Engineering**

Owner / Contact **Nicolaas Swart**

Effective Date **10/2/95**

Revised on

Sunset Date

Additional Information
Description, Background, Authorization

TRAFFIC ENGINEERING DIVISION
MARICOPA COUNTY DEPARTMENT OF TRANSPORTATION
Policy/Procedure Guideline

SECTION 16: Street Lighting

EFFECTIVE DATE: October 2, 1995

- PARAGRAPH:**
- 1. Purpose
 - 2. Description
 - 3. Exhibits
 - 4. Background
 - 5. Authorization
 - 6. References
 - 7. Attachments

1. PURPOSE:

To have a uniform policy for the installation of street lights along roads or intersections under the jurisdiction of Maricopa County.

2. DESCRIPTION:

To help further clarify Maricopa County's policy how roads or intersections get street lighting is identified by the following four methods:

- a. **Forming of a Street Light Improvement District (SLID).** It is the first method that could be used to establish street lights. The Maricopa County Attorney for many years has stated that citizens who desire street lights in their neighborhood, and have a majority in agreement can get street lights utilizing this method. All costs are borne by the residents and are collected thru county property taxes. This method is organized thru the Superintendent of Streets Office of Maricopa County.

- b. **Private lighting agreement** between a citizen and the local utility company. This is where a citizen wants to light-up the front of his residence by requesting thru the utility company the installation of a dusk to dawn light. All costs are borne by the citizen who pays a monthly fee to the utility company. Basically there is no coordination of this method by MCDOT.

- c. Street lights at **signalized intersections** are provided as a policy of the Traffic Engineering Division for over 20 years. If possible; and if appropriate, a street light is installed on each corner of the intersection as long as there is no over-head utility conflicts. The fees for this lighting is billed to the Traffic Engineering Division on a monthly basis until relieved of responsibility by annexation or incorporation.
- d. **Night accident history** would be the final method that could justify the installation of street lights. This method is at approval of the County Traffic Engineer after all other possible remedial actions have been exhausted without noticeable improvement in nighttime accident experience. The fees for this lighting is billed to the Traffic Engineering Division on a monthly basis by the local utility company until relieved of responsibility by annexation or incorporation.

3. **EXHIBITS:**

Non-applicable.

4. **BACKGROUND:**

The traffic engineer felt it was important to explain MCDOT's long running policy regarding the installation of street lights on county roads. Due to the size of Maricopa County, the rural nature of many of the roads, the lack of available electrical power, and the substantial commitment required to set aside funding have been the major factors which discouraged a comprehensive county road lighting policy. With the exception of lighting at signalized intersection or a nighttime accident problem, street lights in Maricopa County are requested, installed, and funded by the ultimate neighborhood user.

5. **AUTHORIZATION:**

- a. For method 2a: ARS Title 48, Chapter 6, Article 1.
- b. For methods 2c and 2d: By direction of the Department of Transportation Traffic Engineer.

6. **REFERENCES:**

Non-Applicable.

7. **ATTACHMENTS:**

- a. "An Information Sheet About Improvement Districts."

Approved: _____


Albert G. Letzkus, P.E.
County Traffic Engineer



Maricopa County

Office of The Superintendent of Streets

2901 W. Durango Street
Phoenix, Arizona 85009

****STEP 1: THIS COVERS THE INITIAL CONSTRUCTION COSTS****

AN INFORMATION SHEET ABOUT IMPROVEMENT DISTRICTS

What Is An Improvement District?

An improvement district is designed to provide neighbors a method of accomplishing local improvements and distributing the cost among all property owners who benefit.

How Do I Go About Getting One Organized?

To initiate an improvement district, a request for a petition must be submitted, in writing, to the Office of the Superintendent of Streets, outlining the extent of the improvements desired, (e.g., street paving, water or sewer lines, street lights, etc.). A petition, which includes the district boundary and a cost estimate, will then be returned to obtain signatures of either a majority of persons owning real property within the district or the owners of fifty-one percent (51%) or more of the real property within the district.

Upon receipt of a petition with sufficient signatures, the Superintendent of Streets will proceed with formation of the district. Proceedings and hearings as required by state law will be conducted with the Maricopa County Board of Supervisors serving as the Board of Directors of the district. This process, from start to finish, takes a minimum of eighteen (18) months to complete, depending on design and construction time requirements.

How Do I Pay For The Improvements?

The total cost of the improvement is either financed by special assessment bonds purchased through public bid or collected annually on the tax roll (for street lights and road maintenance).

Once the improvements are complete, an assessment is placed on every lot and/or parcel within the district. For districts financed with bonds, the assessment may be paid for:

- a) In cash, during the time provided, normally 30 days, or
- b) By semiannual installments of principal and interest (May and November), for a period not to exceed 20 years. The current interest rate on bonds is eight percent (8%).

If, after an assessment has gone to bond and an early payoff is desired, the payoff will include the unpaid principal balance *PLUS* interest to the next payment period *PLUS* a five percent (5%) penalty on the unpaid balance (premium to bond holder).

What If I Can't Make The Payments?

If an assessment becomes delinquent, the district is obligated to sell the property covered by that assessment to pay the special assessment bonds. The buyer is required to hold the lien for a minimum of one year before applying for a Superintendent of Streets deed to the property. During that period, the - assessment lien must be paid in full, plus penalties. Once a deed is issued, the buyer has control of its redemption value.

For districts on the tax roll, it is considered the same as delinquent taxes.

Who Can I Talk To For More Information?

For further information on improvement districts within unincorporated areas of Maricopa County, contact the Office of the Superintendent of Streets at (602) 506-8798.



Maricopa County

Office of The Superintendent of Streets

2901 W. Durango Street
Phoenix, Arizona 85009

*****STEP 2: THIS COVERS THE OPERATION AND MAINTENANCE COSTS** AN INFORMATION SHEET ABOUT STREETLIGHT IMPROVEMENT DISTRICTS***

What Is A Street Lighting Improvement District?

A street lighting improvement district (SLID) is a mechanism for residents to incorporate street lights into their neighborhood. The SLID provides the ability for the lighting of public streets and parks and assesses the cost of operation and maintenance among all property owners within the district.

Note: A SLID cannot be used for lighting of private subdivisions. Typically, the operation and maintenance of streetlights in a private development become the responsibility of the Home Owners Association.

How Do I Go About Getting One Organized?

To initiate an improvement district, a written request for a petition must be submitted to the Office of the Superintendent of Streets, outlining the extent of the improvements desired, along with a legal description and map. A petition, which includes the district, will then be returned to obtain signatures of either a majority of persons owning real property within the district or the owners of fifty-one percent (51%) or more of the real property within the district.

Upon receipt of a petition with sufficient signatures, the Superintendent of Streets will proceed with setting the hearing to organize the district before the Maricopa County Board of Supervisors. If signatures representing one-hundred percent (100%) of the real property within the district are received, the formal notice of a public hearing is not required and the hearing can proceed at the first available Board meeting. Proceedings and hearings as required by state law will be conducted with the Board of Supervisors serving as the Board of Directors of the district. This process, from start to finish, takes a minimum of three (3) months to complete, depending on design and construction time requirements.

How Are The Property Owners Assessed For Operation And Maintenance?

For new developments, the construction cost is borne by the developer and the operation and maintenance costs are paid for through the SLID. Per statute, the properties are assessed based on assessed value, unless the petitioners specifically request costs to be assessed per square footage of property. (This method must be approved by Board of Directors). SLID costs are collected annually as part of the property tax bill, under the Special District Detail section.

Who Can I Talk To For More Information?

For further information on improvement districts within unincorporated areas of Maricopa County, contact the Office of the Superintendent of Streets at (602) 506-8798.



Maricopa County

Office of The Superintendent of Streets

2901 W. Durango Street
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AN INFORMATION SHEET ABOUT STREETLIGHT IMPROVEMENT DISTRICTS

What Is A Street Lighting Improvement District?

A street lighting improvement district (SLID) is designed to provide new developments a method of accomplishing the improvements within the public rights-of-way, the construction cost is borne by the developer, and then distributing the cost of operation and maintenance among all property owners who benefit.

Note: SLID cannot be used for lighting of private subdivisions. Typically, the operation and maintenance of streetlights in a private development become the responsibility of the Home Owners Association or comparable authority.

How Do I Go About Getting One Organized?

To initiate an improvement district, a request for a petition must be submitted, in writing, to the Office of the Superintendent of Streets, outlining the extent of the improvements desired, along with a legal description and map. A petition and developer's/petitioner's verification document, which includes the district boundary will then be returned to obtain signature(s) of the person(s) owning real property within the district or the owner(s) of one-hundred percent (100%) of the real property within the district.

Upon receipt of a petition with sufficient signatures, the Superintendent of Streets will proceed with formation of the district. Proceedings and hearings as required by state law will be conducted with the Maricopa County Board of Supervisors serving as the Board of Directors of the district. This process, from start to finish, takes a minimum of three (3) months to complete, depending on design and construction time requirements.

How Are The Property Owners Assessed For Operation And Maintenance?

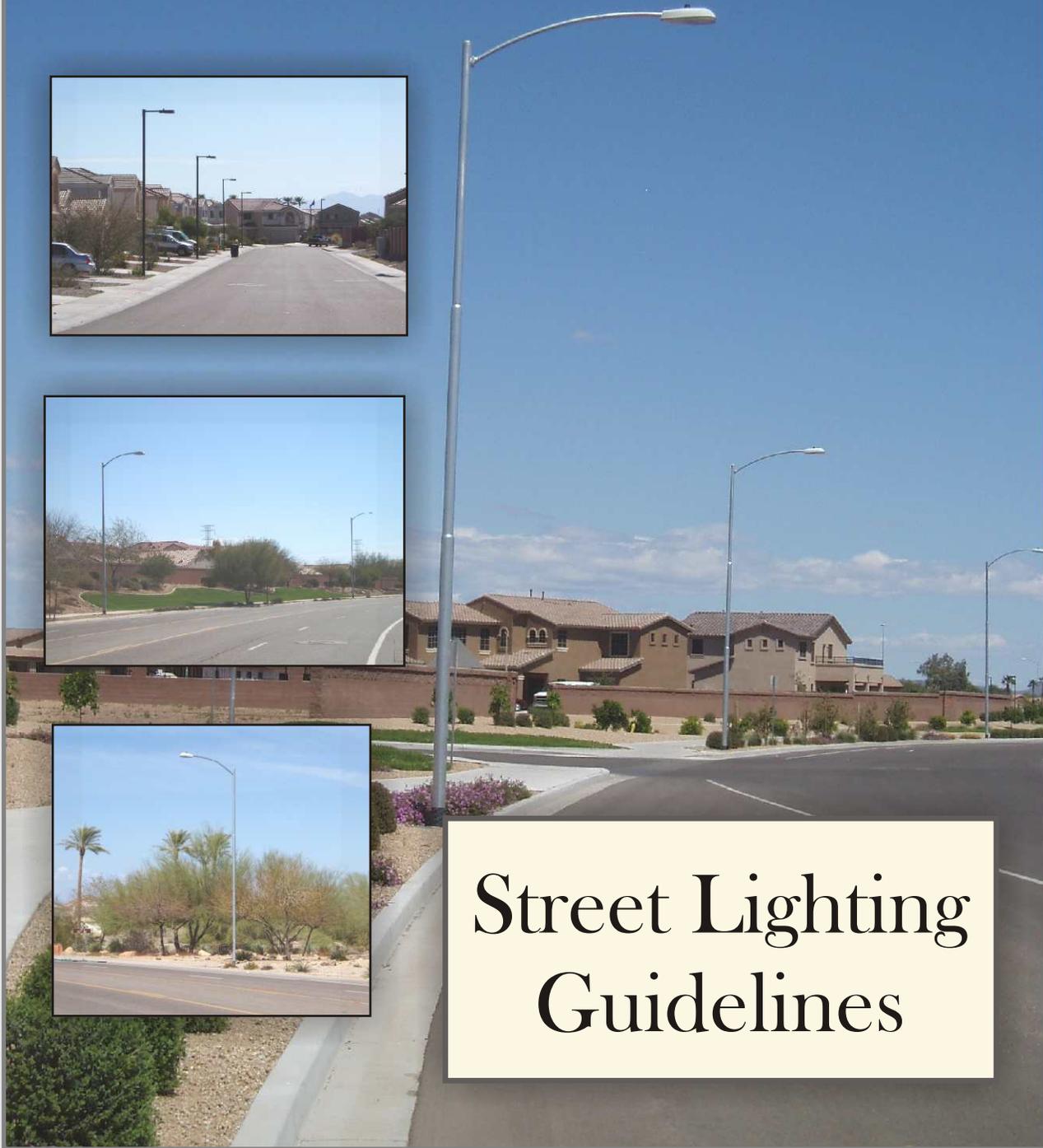
Per statute, the properties are assessed for the utility costs based on assessed value (or by square footage if requested and specifically approved by SOS). This is the cost that shows up on the tax bills, under the Special District Detail section. The tax rate necessary to recover utility costs is determined by the Finance Department; they also receive the monthly bills from the utility company and coordinate payment.

Who Can I Talk To For More Information?

For further information on improvement districts within unincorporated areas of Maricopa County, contact the Office of the Superintendent of Streets at (602) 506-8797.



Maricopa County Department of Transportation



Street Lighting Guidelines

Table of Contents

Chapter 1: Street Lighting Applications

- 1.1 National Standards
- 1.2 Purpose of Roadway Lighting
- 1.3 Street Lighting Policy

Chapter 2: Street Lighting Glossary

- 2.1 Standard Definitions

Chapter 3: General Street Lighting Requirements

- 3.1 Design Criteria, Analysis, and Specifications
- 3.2 General Requirements for Lighting Design Plans
- 3.3 General Notes to be Included on Lighting Plans
- 3.4 References

Chapter 4: Intersection Lighting

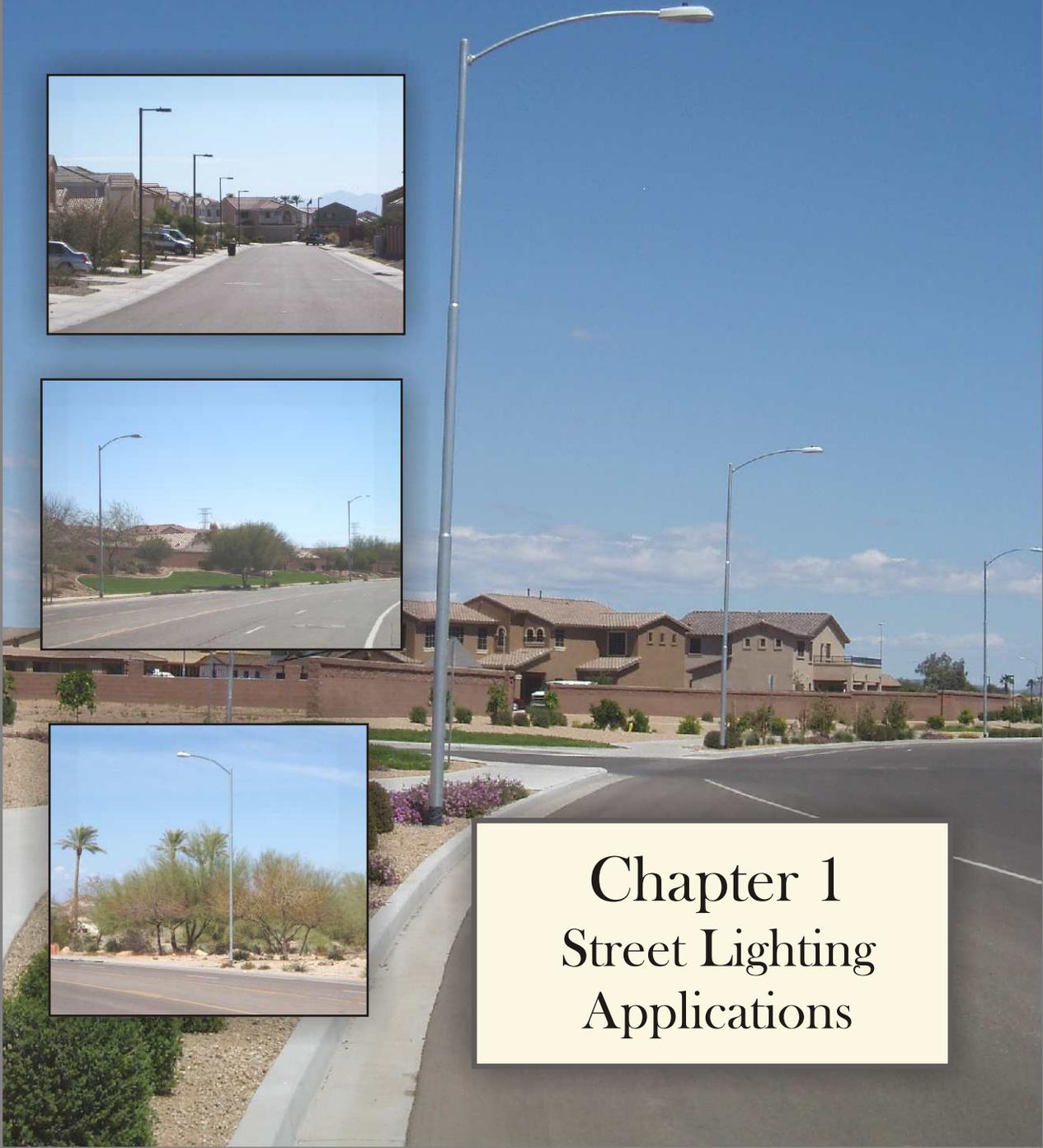
- 4.1 Intersection Lighting Level Requirements
- 4.2 Intersection Lighting – Typical Pole Location
- 4.3 Layout 1: Principal Arterial/Principal Arterial
- 4.4 Layout 2: Principal Arterial/Minor Arterial
- 4.5 Layout 3: Principal Arterial/Major Collector
- 4.6 Layout 4: Principal Arterial/Local Road
- 4.7 Layout 5: Minor Arterial/Minor Arterial
- 4.8 Layout 6: Minor Arterial/Major Collector
- 4.9 Layout 7: Minor Arterial/Local Road
- 4.10 Layout 8: Major Collector / Major Collector
- 4.11 Layout 9: Major Collector /Local Road
- 4.12 Layout 10: Minor Collector/Minor Collector
- 4.13 Layout 11: Local Road/Local Road
- 4.14 Layout 12: Roundabout

Chapter 5: Roadway Lighting

- 5.1 Level Requirements
- 5.2 Median Layout
- 5.3 Staggered Layout
- 5.4 Single Side Layout
- 5.5 Sample Pole Spacing



Maricopa County Department of Transportation



Chapter 1 Street Lighting Applications

1.1 National Standards

The generally accepted authority in the area of roadway lighting is the Illuminating Engineering Society of North America (IESNA). In 2000, under the rules of procedure of the American National Standards Institute (ANSI), the IESNA sponsored the development of the American National Standard Practice for Roadway Lighting. The lighting standards that were developed were issued as the ANSI/IESNA Recommended Practice-8-00 (RP-8-00). RP-8-00 has become the primary resource for roadway lighting design in the United States and is the basis from which state and local transportation agencies have developed their own lighting policies and design procedures.

In order to address growing concerns with obtrusive light and artificial sky glow, the International Dark-Sky Association (IDA) and the Illuminating Engineering Society of North America (IESNA) are currently developing a joint Model Lighting Ordinance (MLO). The MLO addresses four primary areas of concern: excessive lighting, light that trespasses onto neighboring properties, glare, and sky glow. The MLO provides guidance for establishing Lighting Zones (LZ), allowing municipalities to restrict lighting use throughout the community based on levels of ambient light, activity use, and other community considerations. The MLO defines when lighting should be installed and provides guidance on lighting curfews, when lighting should be dimmed or turned off.

Currently, the Maricopa County Zoning Ordinance, Chapter 11, Section 1112 “Outdoor Light Control Provisions” provides provisions to encourage good lighting practices such that lighting systems are designed to conserve energy and money, while increasing nighttime safety, utility, security and productivity.

1.2 Purpose of Roadway Lighting

The principal purpose of roadway lighting is to provide an appropriate level of illumination in order to enhance the nighttime visibility of roadway features, pedestrians and bicyclists to motorists and to improve public safety. The proper use of roadway lighting produces economic and social benefits to the public, including:

- reduction in nighttime accidents and the accompanying human misery and economic loss;
- aid to police protection and enhanced sense of personal security;
- facilitation of traffic flow; and
- promotion of business and the use of public facilities during the nighttime hours.

1.3 Street Lighting Policy

1. Purpose

The purpose of this policy is to provide a uniform, comprehensive policy for the installation of street lighting on Maricopa County roadways.

2. Background

This policy addresses the various conditions under which street lighting may be installed on County roadways. Considering the size of Maricopa County, the rural nature of many of the roads, the lack of available electrical power, and the substantial financial commitment, Maricopa County's lighting policy does not promote establishing a comprehensive roadway lighting program. With the exception of lighting at signalized intersection or other warranted locations, street lights in Maricopa County are requested, installed, and funded by residents or local municipalities.

3. Description

Street lighting can be installed on Maricopa County roadways according to the following methods and procedures.

a. Local Streets

- i. ***Street Light Improvement District (SLID)***. Forming an improvement district can be used to establish street lighting on local or neighborhood streets. Citizens who desire street lighting in their neighborhood, and have a majority in agreement, can utilize the improvement district process. All design and installation costs are borne by the residents and are collected through the Superintendent of Streets Office of Maricopa County. The operation and maintenance costs are collected through a tax assessment on properties within the improvement district as a Special District Tax.
- ii. ***New Subdivisions***. Street lighting may be installed within new subdivisions. Subdivision lighting is at the discretion of the development and is not required by Maricopa County Department of Transportation. This subdivision lighting may include illumination of the intersection(s) of the subdivision roadways with collector or arterial roadways. All design and installation costs will be the responsibility of the subdivision developer. Operations and maintenance costs will be paid for by the residents of the subdivision and will be collected through a tax assessment as a Special District Tax.

b. Arterial and Collector Streets

- i. ***Signalized Intersections***. Street lights at signalized intersections are provided as a policy of the Traffic Management Division. The operations cost for this lighting is billed to the Traffic Management

FINAL DRAFT
STREET LIGHTING GUIDELINES

Division on a monthly basis until Maricopa County is relieved of responsibility by annexation or incorporation.

- ii. ***Private Lighting Agreement.*** A property owner may desire to improve the night-time visibility of their access to an adjacent local, collector or arterial roadway. Installation of a dusk-to-dawn light can be achieved through a private lighting agreement between a citizen and the local utility company. All costs are borne by the resident, who pays a monthly fee to the utility company. There is no coordination of this method with Maricopa County and it is preferred that lighting fixtures be located outside of the public rights-of-way or affixed to a public utility pole, to the extent possible.
- iii. ***Roadways and Unsignalized Intersections.*** Installation of lighting along a roadway or at an unsignalized intersection may be considered when, over a 4-year period, the ratio of the nighttime accident rate to the day-time accident rate exceeds 1.5.

Installation of roadway and unsignalized intersection lighting will be at the approval of the Maricopa County Traffic Engineer after all other possible remedial actions have been exhausted without noticeable improvement in nighttime accident experience. All costs associated with the design, installation, operation, and maintenance of these lighting systems will be paid by the Maricopa County Department of Transportation until relieved of responsibility by annexation or incorporation.

Roadway and unsignalized intersection lighting, in order to improve visibility, may also be installed as noted in parts a.i. and b.ii. above.

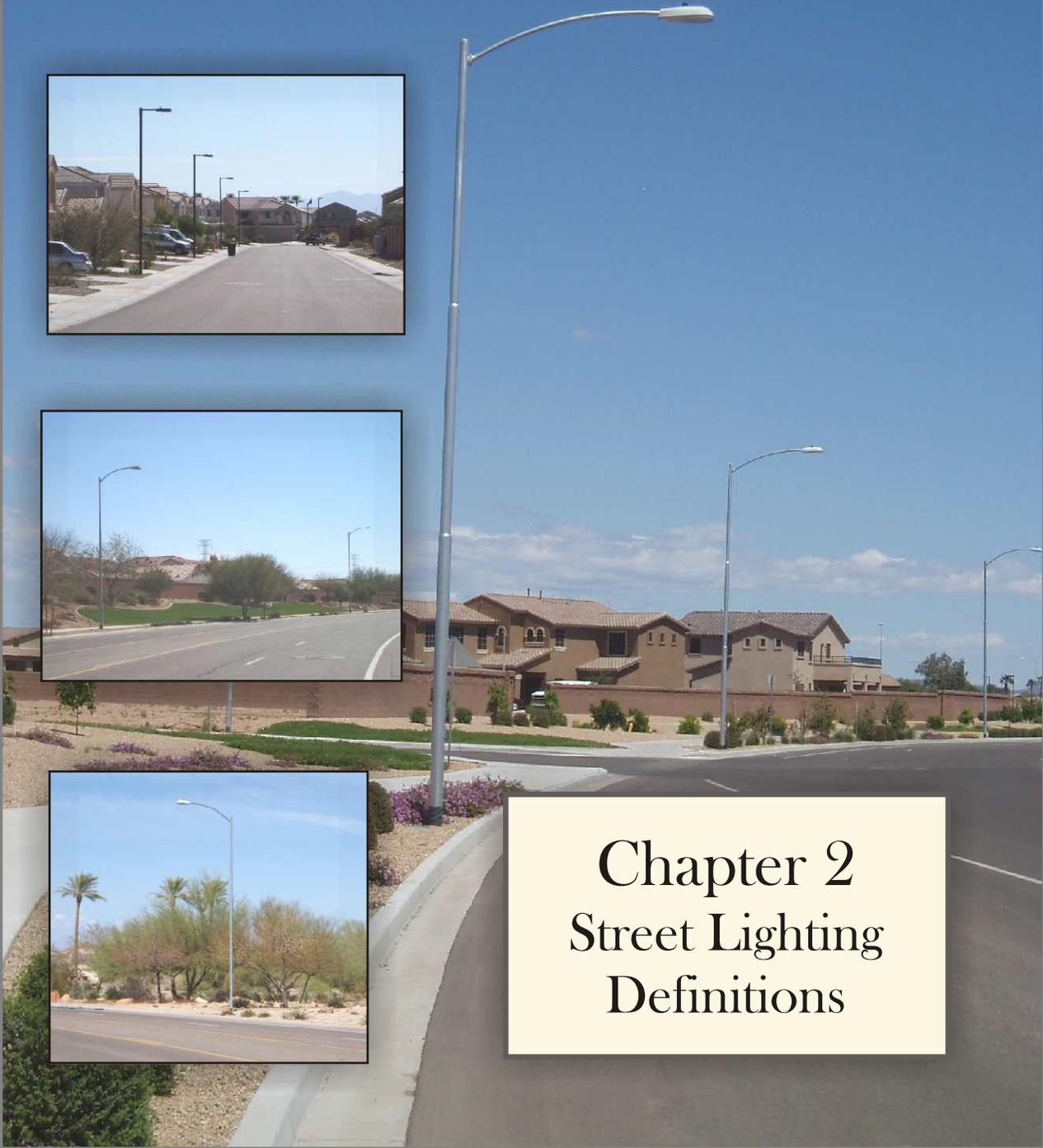
- iv. ***Mid-Block Pedestrian Crossings.*** Installation of mid-block pedestrian crossings is not recommended by Maricopa County Department of Transportation. For school crossing locations and corresponding lighting requirements, refer to the Maricopa County School Crossing Policy.
- v. ***Infill and Fringe Area Roadway Sections.*** Roadway lighting may be installed on infill and fringe area roadway sections in order to complete the adjacent municipality's street lighting system. Installation of this lighting will be handled through an Intergovernmental Agreement initiated by the municipality. All costs associated with the street lighting within the infill and fringe areas, including design, installation, operations, and maintenance shall be the responsibility of the municipality.

c. Roadway Lighting Design Criteria.

All roadway lighting installed on Maricopa County roadways will adhere to the lighting design guidelines provided in the Maricopa County Department of Transportation Street Lighting Guidelines or as defined in an IGA.



Maricopa County Department of Transportation



Chapter 2 Street Lighting Definitions

2.1 Standard Definitions

Average Illumination: The average level of horizontal illuminance on the roadway pavement after accounting for diminishing lamp output over time and the effect of accumulated dirt and grime on the luminaire lens; expressed in average foot-candles for the pavement analysis area.

Average/Minimum Uniformity Ratio: The ratio of average foot-candles of illuminance on the pavement area to the foot-candles at the point of minimum illuminance on the pavement area being analyzed.

CBD: Refers to a Central Business District

Continuous Roadway Lighting: Refers to roadways that have lighting installed along an entire segment, not only at intersections or access points.

Engineer: Refers to Maricopa County Traffic Engineer or designated representative.

Intersection Only Lighting: Refers to roadways that have lighting installed only at intersections. This may also be referred to as non-continuous lighting.

Pedestrian Usage Classifications:

- a. **High:** Areas with significant numbers of pedestrians expected to be on the sidewalks or crossing the streets during darkness. Pedestrian volume is over 100 during the peak nighttime hour. Examples include downtown retail areas, theatres, concert halls, stadiums, and transit terminals.
- b. **Medium:** Areas where lesser numbers of pedestrians utilize the streets at night. Pedestrian volume is 11 to 100 during the peak nighttime hour. Examples include downtown office areas, libraries, apartments, shopping, industrial, transit lines.
- c. **Low:** Areas with very low volumes of night pedestrian usage. Pedestrian volume is 10 or fewer during the peak nighttime hour. Examples include suburban single family streets, low density residential developments, rural or semi rural areas.

Roadway Classifications:

- a. **Major:** The part of the roadway system that serves as the principal network for local traffic through trips and circulation. These roadways are often known as arterials or thoroughfares and sometimes are divided into primary and secondary.

FINAL DRAFT
STREET LIGHTING GUIDELINES

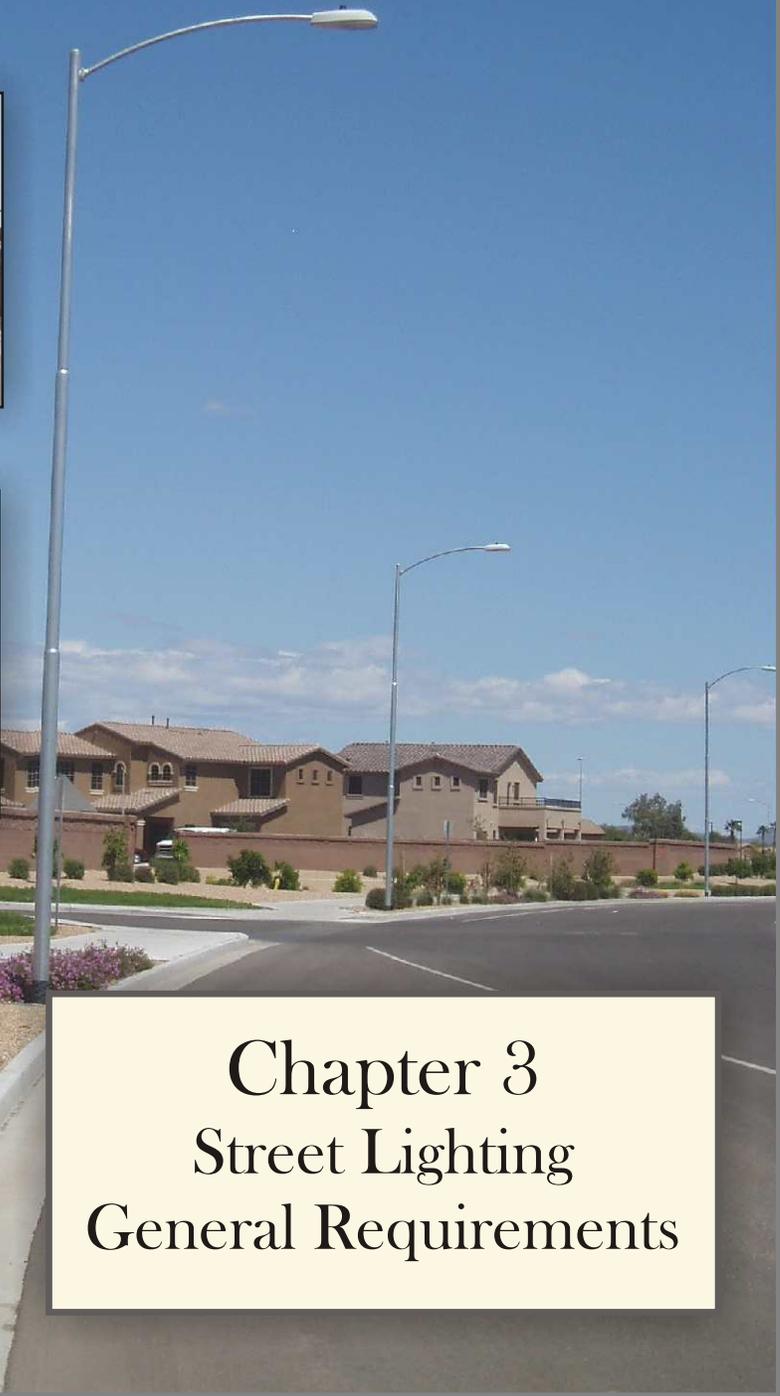
- b. **Collector:** Roadways serving traffic between major and local streets used mainly for traffic movements within residential, commercial and industrial areas. These roadways typically do not handle long through trips. They may be used for truck or bus movements and give direct service to abutting properties.
- c. **Local:** Roadways used primarily for direct access to residential, commercial, industrial or other abutting property. These roadways make up a large percentage of the street system but carry a small proportion of traffic.

Rural Roadway: Refers to Maricopa County standard roadway cross sections to be used in rural situations.

Urban Roadway: Refers to Maricopa County standard roadway cross sections to be used in urban situations.



Maricopa County Department of Transportation



Chapter 3 Street Lighting General Requirements

3.1 Design Criteria, Analysis and Specifications

Maricopa County has developed recommended lighting design criteria in the form of average illumination (foot-candles) and average uniformity. The lighting design criteria are based on the roadway classifications and pedestrian/access classifications described below. The specific design criteria recommendations are provided in the following chapters.

Roadway Classifications:

- Major: Maricopa County Principal and Minor Arterial Roadways
- Collector: Maricopa County Major and Minor Collector Roadways
- Local: Maricopa County Local Streets

Pedestrian/Access Classifications:

- High/Business District: Typically >100 pedestrians per peak night hour
- Medium/Urban: Typically 10-100 pedestrians per peak night hour
- Low/Rural: Typically <10 pedestrians per peak night hour

Analysis and Layout:

Each lighting project will require a photometric analysis and design layout to verify appropriate illumination and uniformity are achieved with the selected design equipment. The following information and equipment shall be specified, documented and used in the photometric analysis and design layout.

- Typical pole layout (median, staggered, opposite, single-sided)
- Typical pole spacing
- Typical pole setback from face of curb
- Mast arm length
- Luminaire mounting heights
- Luminaire cut-off type (full cut-off; cut-off, semi cut-off, etc)
- Luminaire distribution type (Type 1, 2, 3, 4, 5)
- Luminaire IES file number
- Lamp type (HPS, LPS, Metal Halide, etc)
- Lamp wattage (100, 150, 250, 400)

Additional Specifications:

The following equipment will also need to be specified and identified on the lighting plans.

- Pole type (direct bury, foundation mounted)
- Pole height
- Pull box sizes
- Conduit type and size
- Conductor sizes
- Electric meter locations
- Photocell locations
- Ground rod locations

3.2 General Requirements for Lighting Design Plans

(Information for Designers)

1. Any lighting projects located fully or partially within Maricopa County shall require that a lighting plan and photometric analysis be submitted to MCDOT for approval.
2. All lighting designs shall be in compliance with the Illumination Engineering Society of North America (IESNA), Recommended Practice (RP-8-00), the AASHTO Lighting Design Guidelines, and the Maricopa County Zoning Ordinance, Chapter 11, Section 1112 “Outdoor Light Control Provisions”.
3. The final approved submittal will include:
 - i. Lighting plans: Submit a separate set of lighting plans. Scale to be no less than 1”=40’;
 - ii. A compact disk containing the electronic lighting design files in MicroStation format: (file.dgn);
 - iii. A redline copy of the last lighting review comments;
 - iv. Photometric analysis results and voltage drop calculations (if applicable).
4. Plans will show the existing and new roadway conditions, including the right-of-way width and pavement width.
5. Plans will identify and dimension all City Limits & County Right-of-Way.
6. Plans will identify centerline and stationing for the roadway.
7. Plans will provide station and offset for each pole location. Offsets may be provided from centerline or face of curb. All clear zone requirements as required by Maricopa County must be met. Other means of locating poles must be approved by the County.
8. Plans will identify all street light equipment to be installed. A list of necessary equipment is provided in Section 3.1.
9. Plans will identify and show all utilities, both overhead and underground. Potential conflicts that may need potholing prior to pole installation will be identified.
10. Plans will show conduit and pull box locations schematically. Plans will identify conduit size, conductor sizes, and lighting circuits.
11. Plans will identify electric meter locations and circuit load requirements.

3.3 General Notes to be Included on Lighting Plans

(Information for Contractors)

1. All construction shall conform to the latest Maricopa County Department of Transportation (MCDOT) Roadway Design Manual, M.A.G. Specifications, and Maricopa County Special Provisions for Construction of Street Improvements.
2. Contractor is to obtain necessary MCDOT permits prior to construction within County right-of-way.
3. Exact location of each new pull box, light pole, and conduit run to be approved by the Engineer prior to installation.
4. Construction of poles, foundations, pull boxes and conduits will follow Arizona Public Service (APS) and/or Salt River Project (SRP) standard construction details. All equipment must be approved for use by APS and/or SRP.
5. The Contractor is responsible for locating all underground and overhead utilities prior to beginning construction, whether shown on the plans or not, and shall protect them from damage. The contractor shall adhere to all Blue Stake law requirements.
6. All lighting equipment that needs to be removed, replaced, relocated or repaired because of the contractor's work will be done at the contractor's expense.

3.4 References

1. “American National Standard Practice for Roadway Lighting,” ANSI RP-8-00, Illuminating Engineering Society of North America, June 27, 2000.
2. “Roadway Lighting Handbook,” Federal Highway Administration, U.S. Department of Transportation, Wash. D.C., December 1978.
3. *Maricopa County Zoning Ordinance, Section 1112 – Outdoor Light Control Provisions*, Maricopa County Planning and Development Department, July 2002.
4. *MAG Uniform Standard Details for Public Works Construction*, Rev. 2005.
5. “An Informational Guide for Roadway Lighting,” American Association of State Highway and Transportation Officials, Wash. D.C., December 1984
6. “IES Lighting Handbook, 1984 Reference Volume,” Illuminating Engineering Society of North America, 1984.
7. “IES Lighting Handbook, 1987 Application Volume,” Illuminating Engineering Society of North America, 1984.
8. “City of Glendale Street Lighting Manual,” Transportation Department Street Lighting Division, City of Glendale, 2001.
9. *Arizona Public Service Company T&D Construction Standards*, 2005. [Online]. Available: <[ww.aps.com/aps_services/Construction/streetlights](http://www.aps.com/aps_services/Construction/streetlights)>.
10. “Materials and Approved Manufacturers for Street Lights,” Arizona Public Service Company, December 20, 2004.



Maricopa County Department of Transportation



Chapter 4 Intersection Lighting

FINAL DRAFT
STREET LIGHTING GUIDELINES

Table 4.1: Intersection Lighting Level Requirements

		EAST/WEST ROADWAY		
		RP-8-00 MAJOR Principal Arterials Road Widths of 95'-120' and Minor Arterials Road Widths of 70'-95'	RP-8-00 COLLECTOR Major Collectors Road Widths of 45'-70' and Minor Collectors Road Widths of 30'-45'	RP-8-00 LOCAL Local Streets Road Widths of 25'-40'
NORTH/SOUTH ROADWAY	RP-8-00 MAJOR Principal Arterials Road Widths of 95'-120' and Minor Arterials Road Widths of 70'-95'	Criteria for Continuous Lighting Avg Illumination- High Ped: 3.4 fc Med Ped: 2.6 fc Low Ped: 1.8 fc Avg/Min Uniformity: 3:1 Criteria for NonContinuous Lighting Avg Illumination- High Ped: 2.6 fc Med Ped: 2.0 fc Low Ped: 1.4 fc Avg/Min Uniformity: 3:1 Layouts 1, 2 & 5	Criteria for Continuous Lighting Avg Illumination- High Ped: 2.9 fc Med Ped: 2.2 fc Low Ped: 1.5 fc Avg/Min Uniformity: 3:1 Criteria for NonContinuous Lighting Avg Illumination- High Ped: 2.6 fc Med Ped: 2.0 fc Low Ped: 1.4 fc Avg/Min Uniformity: 3:1 Layouts 3 & 6	Criteria for Continuous Lighting Avg Illumination- High Ped: 2.6 fc Med Ped: 2.0 fc Low Ped: 1.3 fc Avg/Min Uniformity: 3:1 Criteria for NonContinuous Lighting Avg Illumination- High Ped: 2.6 fc Med Ped: 2.0 fc Low Ped: 1.3 fc Avg/Min Uniformity: 3:1 Layouts 4 & 7
	RP-8-00 COLLECTOR Major Collectors Road Widths of 45'-70' and Minor Collectors Road Widths of 30'-45'	Criteria for Continuous Lighting Avg Illumination- High Ped: 2.9 fc Med Ped: 2.2 fc Low Ped: 1.5 fc Avg/Min Uniformity: 3:1 Criteria for NonContinuous Lighting Avg Illumination- High Ped: 2.6 fc Med Ped: 2.0 fc Low Ped: 1.4 fc Avg/Min Uniformity: 3:1 Layouts 3 & 6	Criteria for Continuous Lighting Avg Illumination- High Ped: 2.4 fc Med Ped: 1.8 fc Low Ped: 1.2 fc Avg/Min Uniformity: 4:1 Criteria for NonContinuous Lighting Avg Illumination- High Ped: 1.8 fc Med Ped: 1.4 fc Low Ped: 0.9 fc Avg/Min Uniformity: 4:1 Layouts 8 & 10	Criteria for Continuous Lighting Avg Illumination- High Ped: 2.1 fc Med Ped: 1.8 fc Low Ped: 1.0 fc Avg/Min Uniformity: 4:1 Criteria for NonContinuous Lighting Avg Illumination- High Ped: 1.8 fc Med Ped: 1.4 fc Low Ped: 0.9 fc Avg/Min Uniformity: 4:1 Layout 9
	RP-8-00 LOCAL Local Streets Road Widths of 25'-40'	Criteria for Continuous Lighting Avg Illumination- High Ped: 2.6 fc Med Ped: 2.0 fc Low Ped: 1.3 fc Avg/Min Uniformity: 3:1 Criteria for NonContinuous Lighting Avg Illumination- High Ped: 2.6 fc Med Ped: 2.0 fc Low Ped: 1.3 fc Avg/Min Uniformity: 3:1 Layouts 4 & 7	Criteria for Continuous Lighting Avg Illumination- High Ped: 2.1 fc Med Ped: 1.8 fc Low Ped: 1.0 fc Avg/Min Uniformity: 4:1 Criteria for NonContinuous Lighting Avg Illumination- High Ped: 1.8 fc Med Ped: 1.4 fc Low Ped: 0.9 fc Avg/Min Uniformity: 4:1 Layout 9	Criteria for Continuous Lighting Avg Illumination- High Ped: 1.8 fc Med Ped: 1.4 fc Low Ped: 0.8 fc Avg/Min Uniformity: 6:1 Criteria for NonContinuous Lighting Avg Illumination- High Ped: 1.4 fc Med Ped: 1.1 fc Low Ped: 0.6 fc Avg/Min Uniformity: 6:1 Layout 11

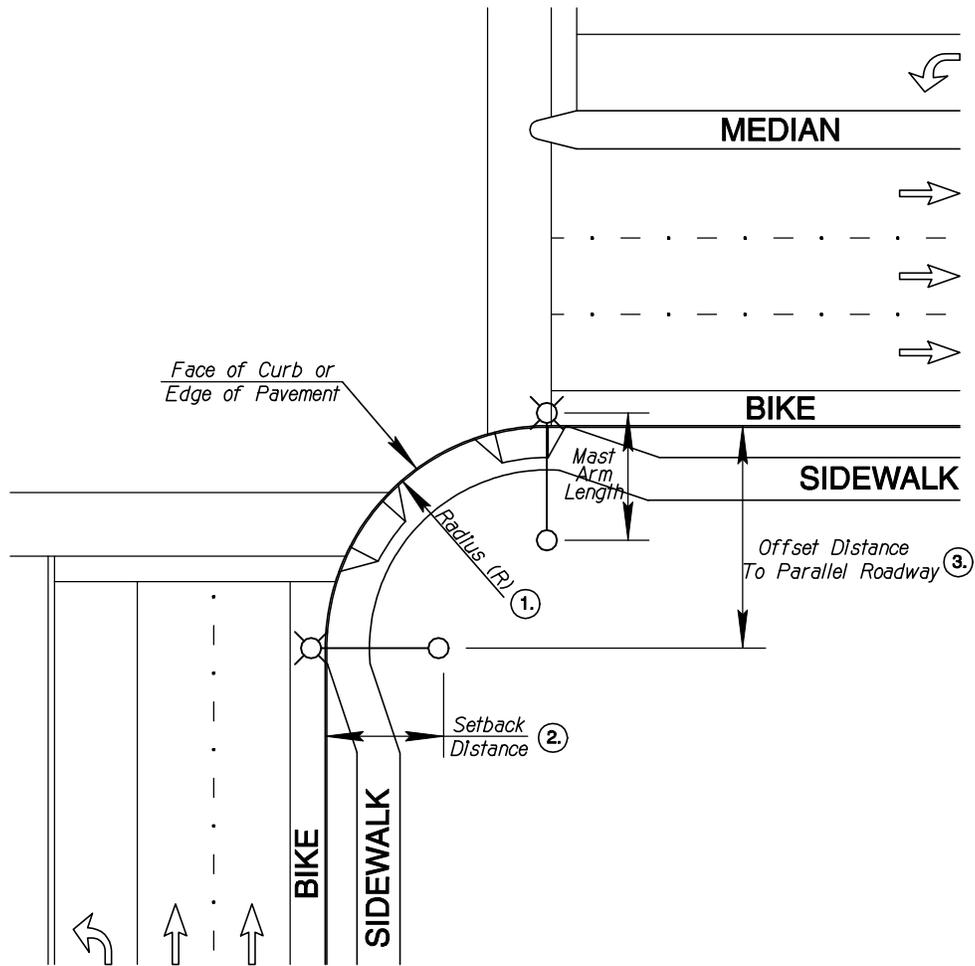
fc = foot-candles

Design Notes:

1. The designer shall verify that the lighting design meets the required lighting levels using the selected equipment and layout.
2. The roadway cross sections are per the functional classifications designated in the MCDOT Roadway Design Manual, Chapter 5.1.
3. All pole layouts shall meet clear zone requirements. For information on clear zone requirements, refer to the MCDOT Roadway Design Manual.
4. The final pole layout and/or any field adjustments shall be approved by the County Traffic Engineer or the designated representative.

FINAL DRAFT
STREET LIGHTING GUIDELINES

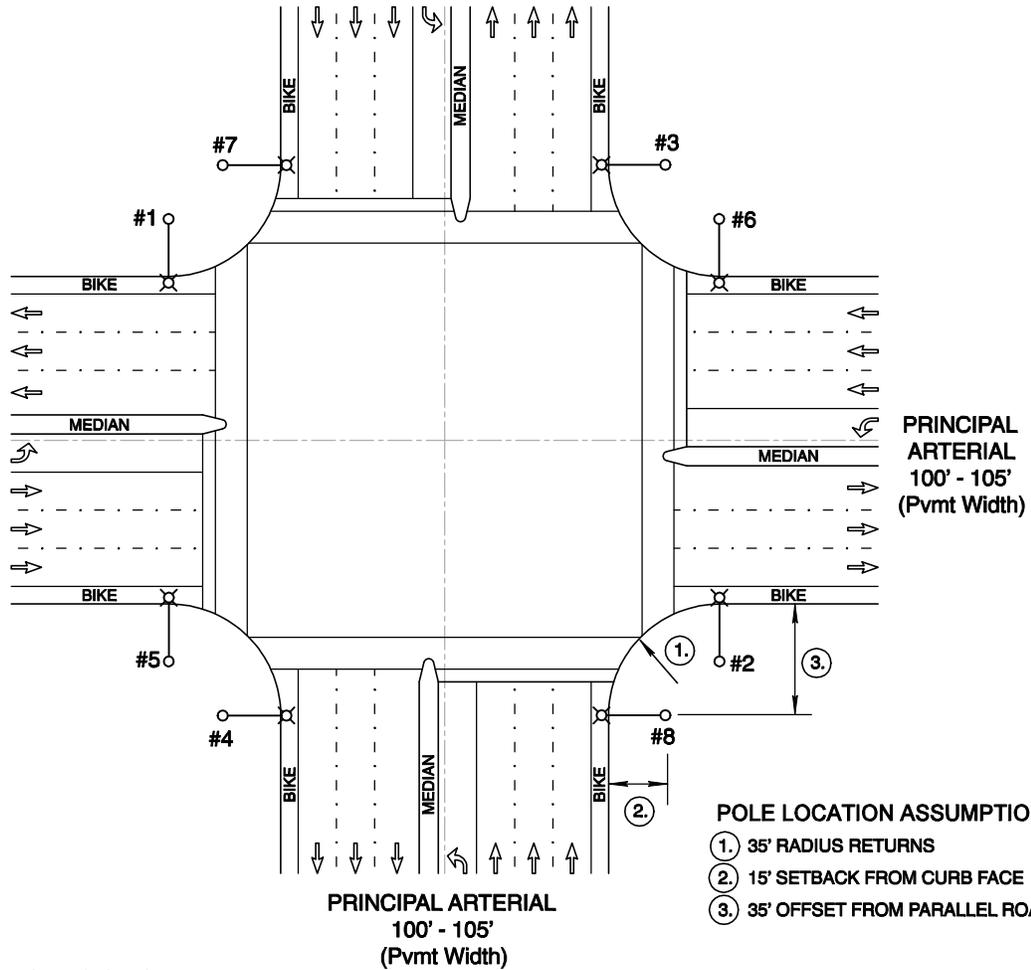
INTERSECTION LIGHTING
TYPICAL POLE LOCATION TERMINOLOGY



1. Street light pole locations will typically be customized to each intersection in order to best meet the required lighting levels. At signalized intersections, street light luminaires will typically be placed on the signal poles.
2. Pole setback and offset distances shall meet clear zone requirements for the projects roadway classifications.
3. When sidewalk is being constructed, street light poles will typically be placed 1' behind sidewalk. If meandering sidewalk is being used, the pole setback distance should be as consistent as possible and the sidewalk should be modified to accommodate the preferred light pole locations.
4. Pole locations will need to be coordinated to avoid conflicts with all new and existing overhead and underground utilities and infrastructure.

**FINAL DRAFT
STREET LIGHTING GUIDELINES**

**INTERSECTION LIGHTING
LAYOUT 1: PRINCIPAL ARTERIAL / PRINCIPAL ARTERIAL**



LIGHTING DESIGN CRITERIA:

Intersection Conditions		Intersection Lighting Requirements		Sample Configuration Pole Numbers / Luminaires
Lighting Type on Intersecting Roadways	Pedestrian Activity	Average Illumination (fc)	Uniformity Rate Ave fc / Min fc	
Continuous	Urban - Medium	2.6	3:1	#1-#8 / 400w HPS
Continuous	Rural - Low	1.8	3:1	#1-#8 / 250w HPS
Intersection Only	Urban - Medium	2.0	3:1	#1-#8 / 250w HPS
Intersection Only	Rural - Low	1.4	3:1	#1-#8 / 250w HPS

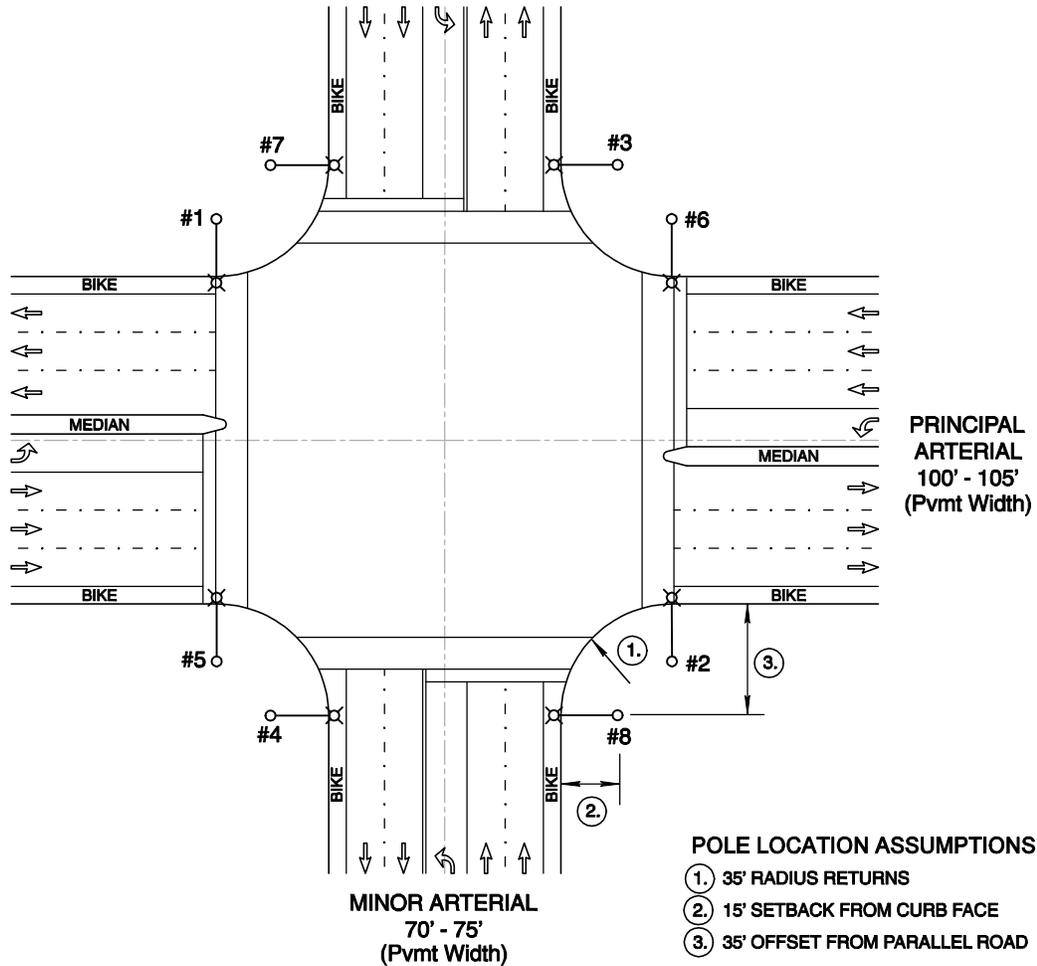
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DESIGN NOTES:

1. The designer shall verify that the lighting design meets the required lighting levels using the selected pole equipment and layout.
2. The roadway cross-sections are per the functional classifications designated in the MCDOT Roadway Design Manual Chapter 5.1.
3. All pole layouts shall meet clear zone requirements. For information on clear zone requirements, refer to the MCDOT Roadway Design Manual.
4. The final pole layout and/or any field adjustments shall be approved by the County Traffic Engineer or the designated representative.

**FINAL DRAFT
STREET LIGHTING GUIDELINES**

**INTERSECTION LIGHTING
LAYOUT 2: PRINCIPAL ARTERIAL / MINOR ARTERIAL**



- POLE LOCATION ASSUMPTIONS**
- ① 35' RADIUS RETURNS
 - ② 15' SETBACK FROM CURB FACE
 - ③ 35' OFFSET FROM PARALLEL ROAD

LIGHTING DESIGN CRITERIA:

Intersection Conditions		Intersection Lighting Requirements		Sample Configuration Pole Numbers / Luminaire
Lighting Type on Intersecting Roadways	Pedestrian Activity	Average Illumination (fc)	Uniformity Rate Ave fc / Min fc	
Continuous	Urban - Medium	2.6	3:1	#1-#8 / 250w HPS
Continuous	Rural - Low	1.8	3:1	#1-#8 / 250w HPS
Intersection Only	Urban - Medium	2.0	3:1	#1-#8 / 250w HPS
Intersection Only	Rural - Low	1.4	3:1	#1-#4 / 250w HPS *

fc: foot-candles

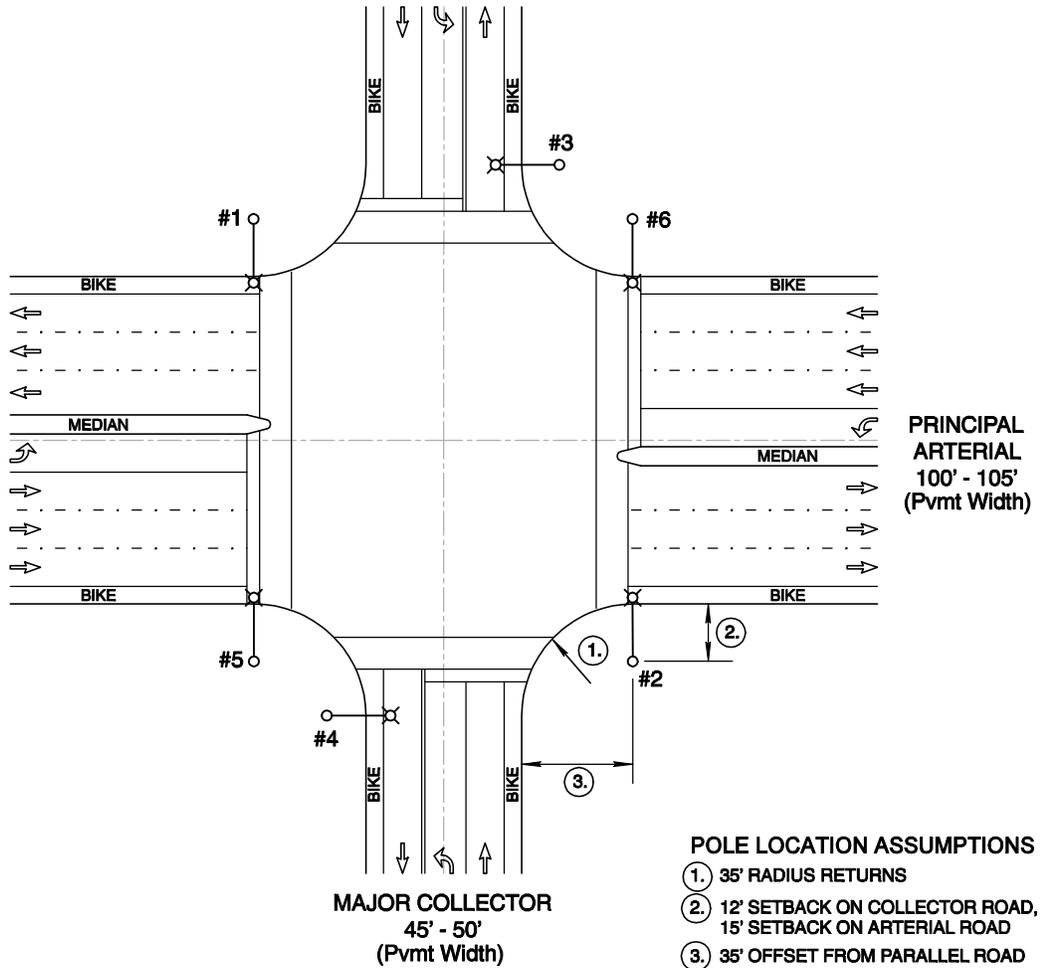
* Requires reduced offsets and setback from the assumptions listed above

DESIGN NOTES:

1. The designer shall verify that the lighting design meets the required lighting levels using the selected pole equipment and layout.
2. The roadway cross-sections are per the functional classifications designated in the MCDOT Roadway Design Manual Chapter 5.1.
3. All pole layouts shall meet clear zone requirements. For information on clear zone requirements, refer to the MCDOT Roadway Design Manual.
4. The final pole layout and/or any field adjustments shall be approved by the County Traffic Engineer or the designated representative.

**FINAL DRAFT
STREET LIGHTING GUIDELINES**

**INTERSECTION LIGHTING
LAYOUT 3: PRINCIPAL ARTERIAL / MAJOR COLLECTOR**



- POLE LOCATION ASSUMPTIONS**
- ① 35' RADIUS RETURNS
 - ② 12' SETBACK ON COLLECTOR ROAD, 15' SETBACK ON ARTERIAL ROAD
 - ③ 35' OFFSET FROM PARALLEL ROAD

LIGHTING DESIGN CRITERIA:

Intersection Conditions		Intersection Lighting Requirements		Sample Configuration Pole Numbers / Luminaires
Lighting Type on Intersecting Roadways	Pedestrian Activity	Average Illumination (fc)	Uniformity Rate Ave fc / Min fc	
Continuous	Urban - Medium	2.2	3:1	#1-#6 / 250w HPS
Continuous	Rural - Low	1.5	3:1	#1-#6 / 250w HPS
Intersection Only	Urban - Medium	2.0	3:1	#1-#6 / 250w HPS
Intersection Only	Rural - Low	1.4	3:1	#1-#4 / 250w HPS *

fc: foot-candles

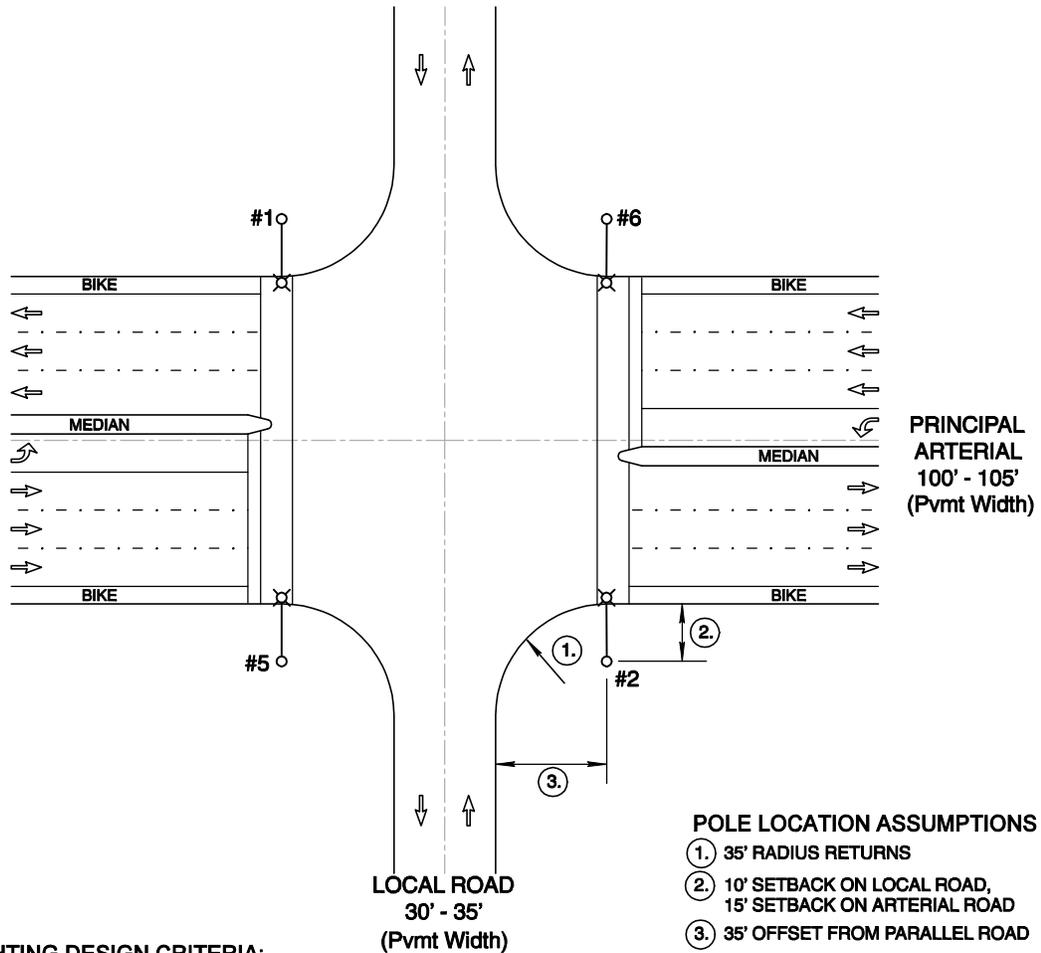
* Requires reduced offsets and setback from the assumptions listed above

DESIGN NOTES:

1. The designer shall verify that the lighting design meets the required lighting levels using the selected pole equipment and layout.
2. The roadway cross-sections are per the functional classifications designated in the MCDOT Roadway Design Manual Chapter 5.1.
3. All pole layouts shall meet clear zone requirements. For information on clear zone requirements, refer to the MCDOT Roadway Design Manual.
4. The final pole layout and/or any field adjustments shall be approved by the County Traffic Engineer or the designated representative.

FINAL DRAFT STREET LIGHTING GUIDELINES

INTERSECTION LIGHTING LAYOUT 4: PRINCIPAL ARTERIAL / LOCAL ROAD



LIGHTING DESIGN CRITERIA:

Intersection Conditions		Intersection Lighting Requirements		Sample Configuration Pole Numbers / Luminaires
Lighting Type on Intersecting Roadways	Pedestrian Activity	Average Illumination (fc)	Uniformity Rate Ave fc / Min fc	
Continuous	Urban - Medium	2.0	3:1	#1, #2, #5, #6 / 400w HPS
Continuous	Rural - Low	1.3	3:1	#1, #2, #5, #6 / 250w HPS or #1, #2 / 400w*
Intersection Only	Urban - Medium	2.0	3:1	#1, #2, #5, #6 / 400w HPS
Intersection Only	Rural - Low	1.3	3:1	#1, #2 / 250w HPS *

fc: foot-candles

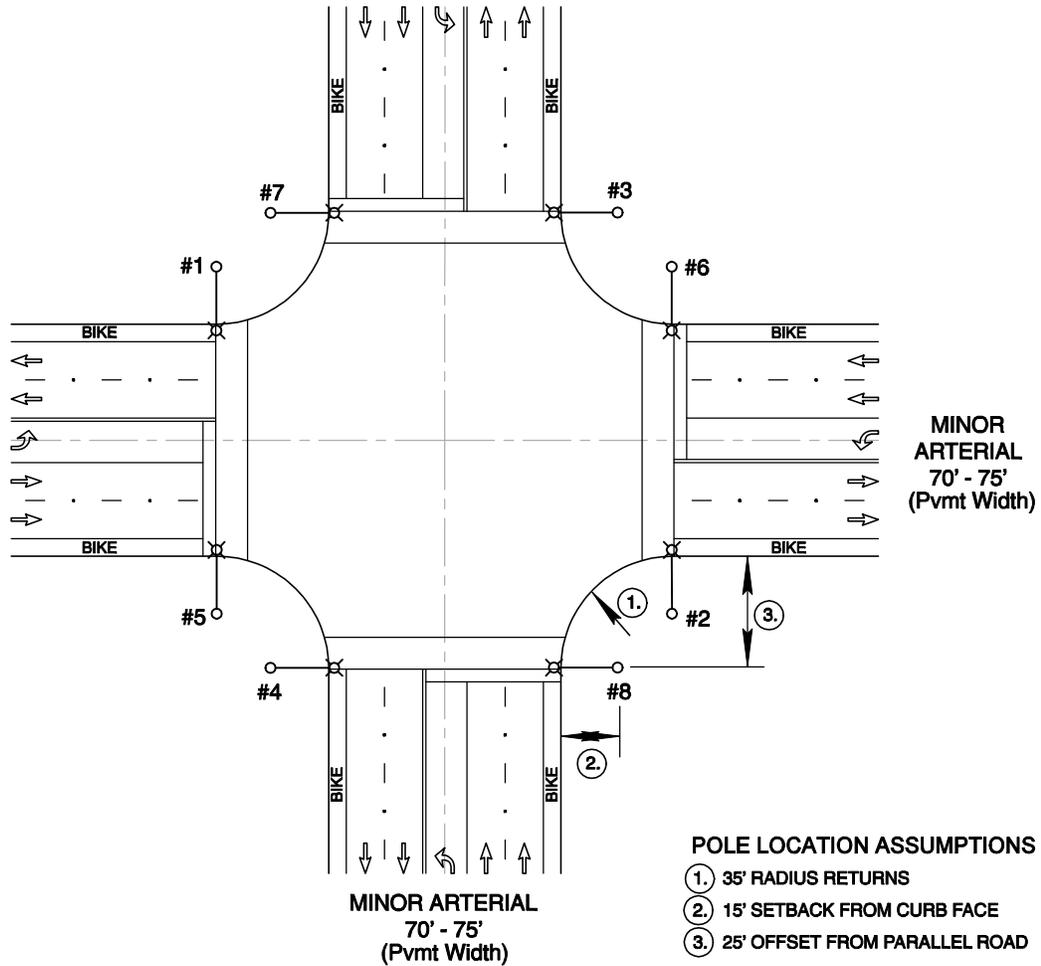
* Requires reduced offsets
and setback from the
assumptions listed above

DESIGN NOTES:

1. The designer shall verify that the lighting design meets the required lighting levels using the selected pole equipment and layout.
2. The roadway cross-sections are per the functional classifications designated in the MCDOT Roadway Design Manual Chapter 5.1.
3. All pole layouts shall meet clear zone requirements. For information on clear zone requirements, refer to the MCDOT Roadway Design Manual.
4. The final pole layout and/or any field adjustments shall be approved by the County Traffic Engineer or the designated representative.

**FINAL DRAFT
STREET LIGHTING GUIDELINES**

**INTERSECTION LIGHTING
LAYOUT 5: MINOR ARTERIAL / MINOR ARTERIAL**



POLE LOCATION ASSUMPTIONS

- ① 35' RADIUS RETURNS
- ② 15' SETBACK FROM CURB FACE
- ③ 25' OFFSET FROM PARALLEL ROAD

LIGHTING DESIGN CRITERIA:

Intersection Conditions		Intersection Lighting Requirements		Sample Configuration Pole Numbers / Luminaires
Lighting Type on Intersecting Roadways	Pedestrian Activity	Average Illumination (fc)	Uniformity Rate Ave fc / Min fc	
Continuous	Urban - Medium	2.6	3:1	#1-#4 / 400w HPS OR #1-#8 / 250w HPS
Continuous	Rural - Low	1.8	3:1	#1-#4 / 250w HPS *
Intersection Only	Urban - Medium	2.0	3:1	#1-#4 / 400w HPS OR #1-#8 / 250w HPS
Intersection Only	Rural - Low	1.4	3:1	#1-#4 / 250w HPS *

fc: foot-candles

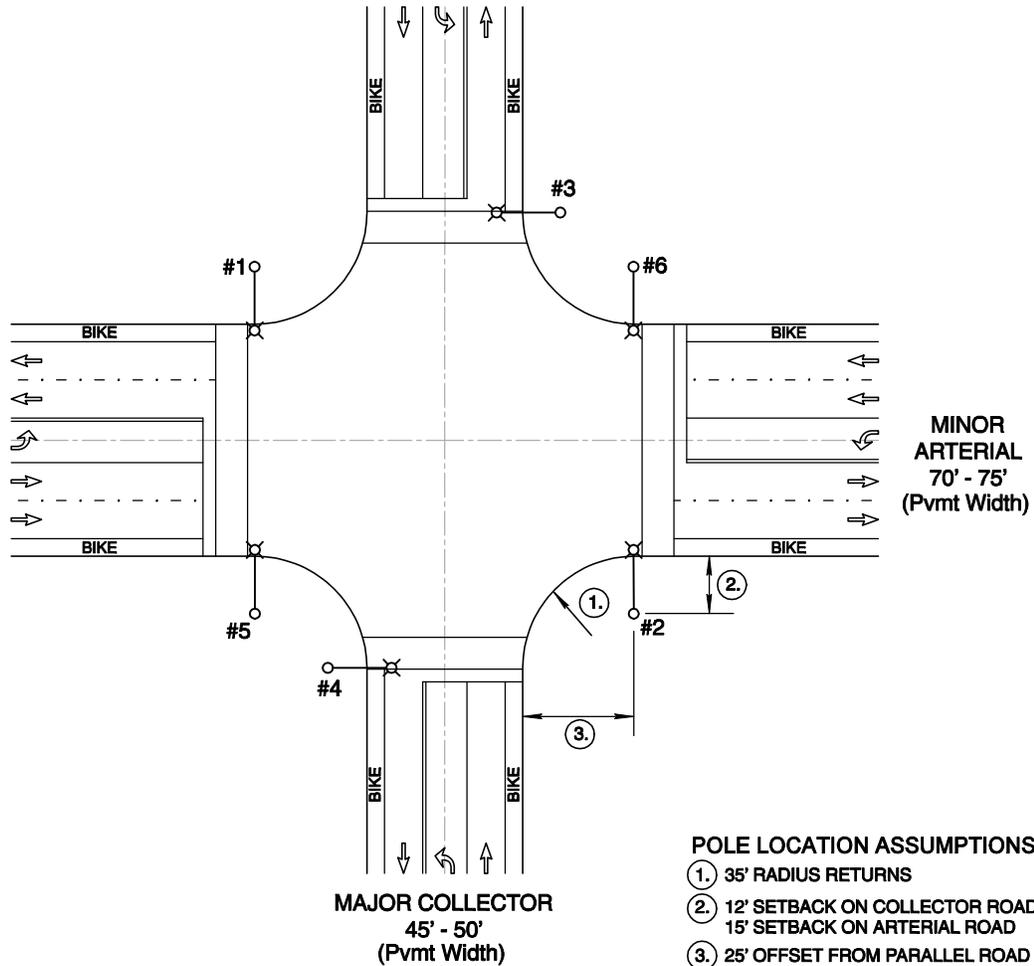
* Requires reduced offsets and setback from the assumptions listed above

DESIGN NOTES:

1. The designer shall verify that the lighting design meets the required lighting levels using the selected pole equipment and layout.
2. The roadway cross-sections are per the functional classifications designated in the MCDOT Roadway Design Manual Chapter 5.1.
3. All pole layouts shall meet clear zone requirements. For information on clear zone requirements, refer to the MCDOT Roadway Design Manual.
4. The final pole layout and/or any field adjustments shall be approved by the County Traffic Engineer or the designated representative.

**FINAL DRAFT
STREET LIGHTING GUIDELINES**

**INTERSECTION LIGHTING
LAYOUT 6: MINOR ARTERIAL / MAJOR COLLECTOR**



LIGHTING DESIGN CRITERIA:

Intersection Conditions		Intersection Lighting Requirements		Sample Configuration Pole Numbers / Luminaires
Lighting Type on Intersecting Roadways	Pedestrian Activity	Average Illumination (fc)	Uniformity Rate Ave fc / Min fc	
Continuous	Urban - Medium	2.2	3:1	#1-#6 / 250w HPS
Continuous	Rural - Low	1.5	3:1	#1-#4 / 250w HPS
Intersection Only	Urban - Medium	2.0	3:1	#1-#6 / 250w HPS
Intersection Only	Rural - Low	1.4	3:1	#1-#4 / 250w HPS

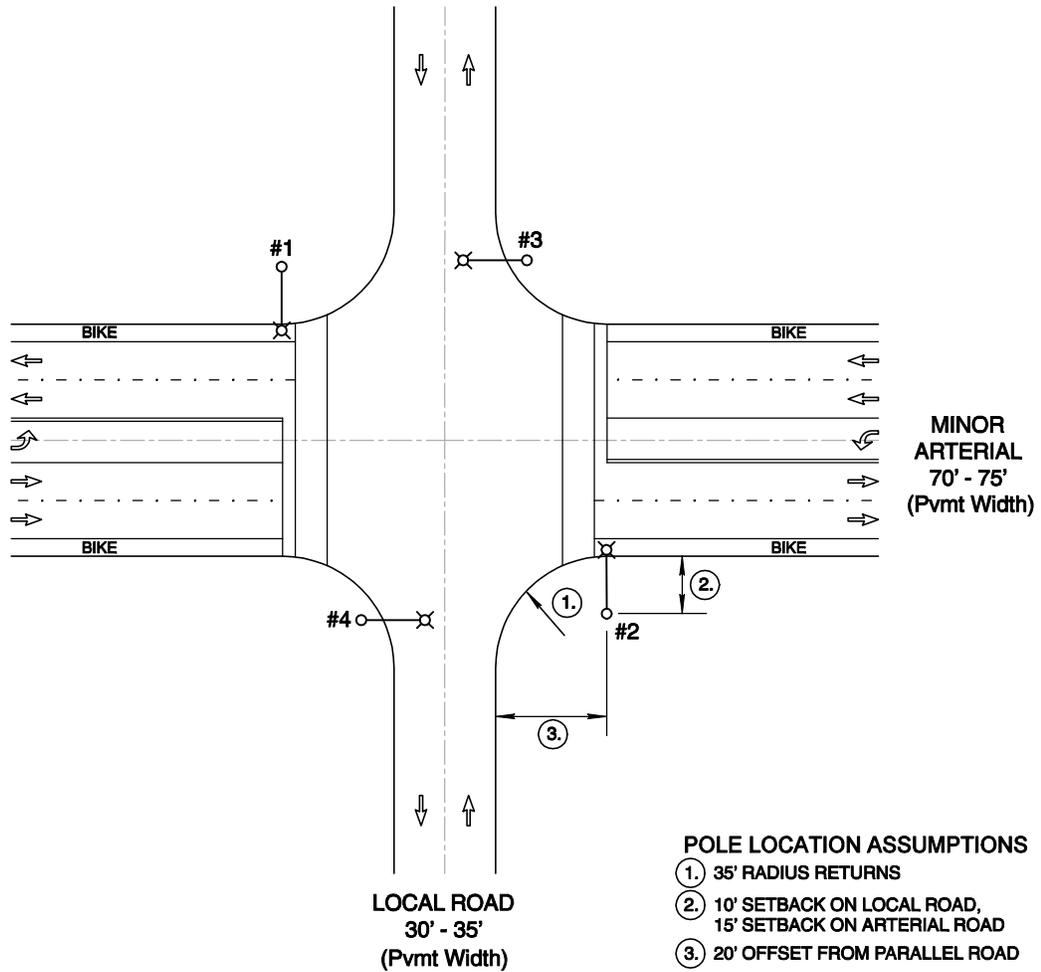
fc: foot-candles

DESIGN NOTES:

1. The designer shall verify that the lighting design meets the required lighting levels using the selected pole equipment and layout.
2. The roadway cross-sections are per the functional classifications designated in the MCDOT Roadway Design Manual Chapter 5.1.
3. All pole layouts shall meet clear zone requirements. For information on clear zone requirements, refer to the MCDOT Roadway Design Manual.
4. The final pole layout and/or any field adjustments shall be approved by the County Traffic Engineer or the designated representative.

**FINAL DRAFT
STREET LIGHTING GUIDELINES**

**INTERSECTION LIGHTING
LAYOUT 7: MINOR ARTERIAL / LOCAL ROAD**



LIGHTING DESIGN CRITERIA:

Intersection Conditions		Intersection Lighting Requirements		Sample Configuration Pole Numbers / Luminaires
Lighting Type on Intersecting Roadways	Pedestrian Activity	Average Illumination (fc)	Uniformity Rate Ave fc / Min fc	
Continuous	Urban - Medium	2.0	3:1	#1-#4 / 250w HPS
Continuous	Rural - Low	1.3	3:1	#1-#4 / 250w HPS
Intersection Only	Urban - Medium	2.0	3:1	#1-#4 / 250w HPS
Intersection Only	Rural - Low	1.3	3:1	#1-#2 / 250w HPS *

fc: foot-candles

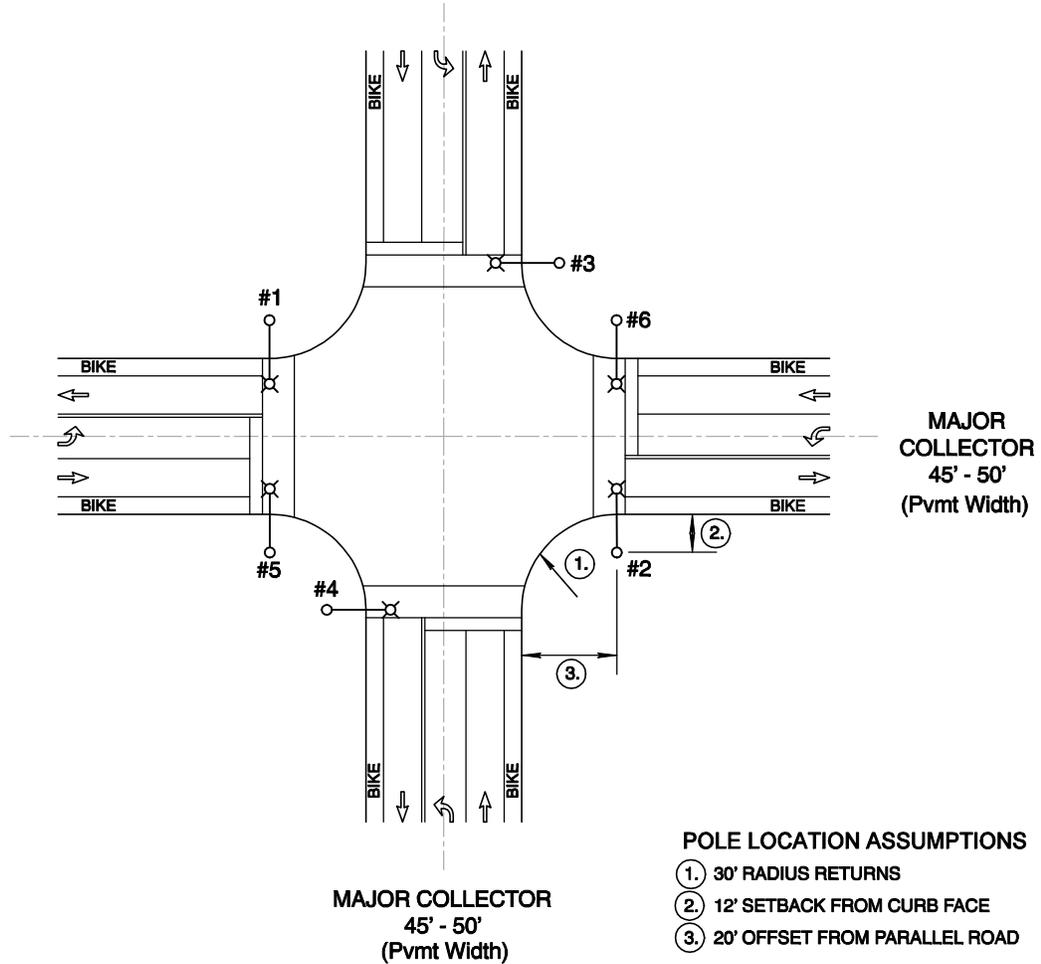
* Requires reduced offsets
and setback from the
assumptions listed above

DESIGN NOTES:

1. The designer shall verify that the lighting design meets the required lighting levels using the selected pole equipment and layout.
2. The roadway cross-sections are per the functional classifications designated in the MCDOT Roadway Design Manual Chapter 5.1.
3. All pole layouts shall meet clear zone requirements. For information on clear zone requirements, refer to the MCDOT Roadway Design Manual.
4. The final pole layout and/or any field adjustments shall be approved by the County Traffic Engineer or the designated representative.

**FINAL DRAFT
STREET LIGHTING GUIDELINES**

**INTERSECTION LIGHTING
LAYOUT 8: MAJOR COLLECTOR / MAJOR COLLECTOR**



POLE LOCATION ASSUMPTIONS

- ① 30' RADIUS RETURNS
- ② 12' SETBACK FROM CURB FACE
- ③ 20' OFFSET FROM PARALLEL ROAD

LIGHTING DESIGN CRITERIA:

Intersection Conditions		Intersection Lighting Requirements		Sample Configuration Pole Numbers / Luminaires
Lighting Type on Intersecting Roadways	Pedestrian Activity	Average Illumination (fc)	Uniformity Rate Ave fc / Min fc	
Continuous	Urban - Medium	1.8	4:1	#1-#4 / 250w HPS
Continuous	Rural - Low	1.2	4:1	#1-#4 / 150w HPS
Intersection Only	Urban - Medium	1.4	4:1	#1-#4 / 250w HPS
Intersection Only	Rural - Low	0.9	4:1	#1-#4 / 150w HPS

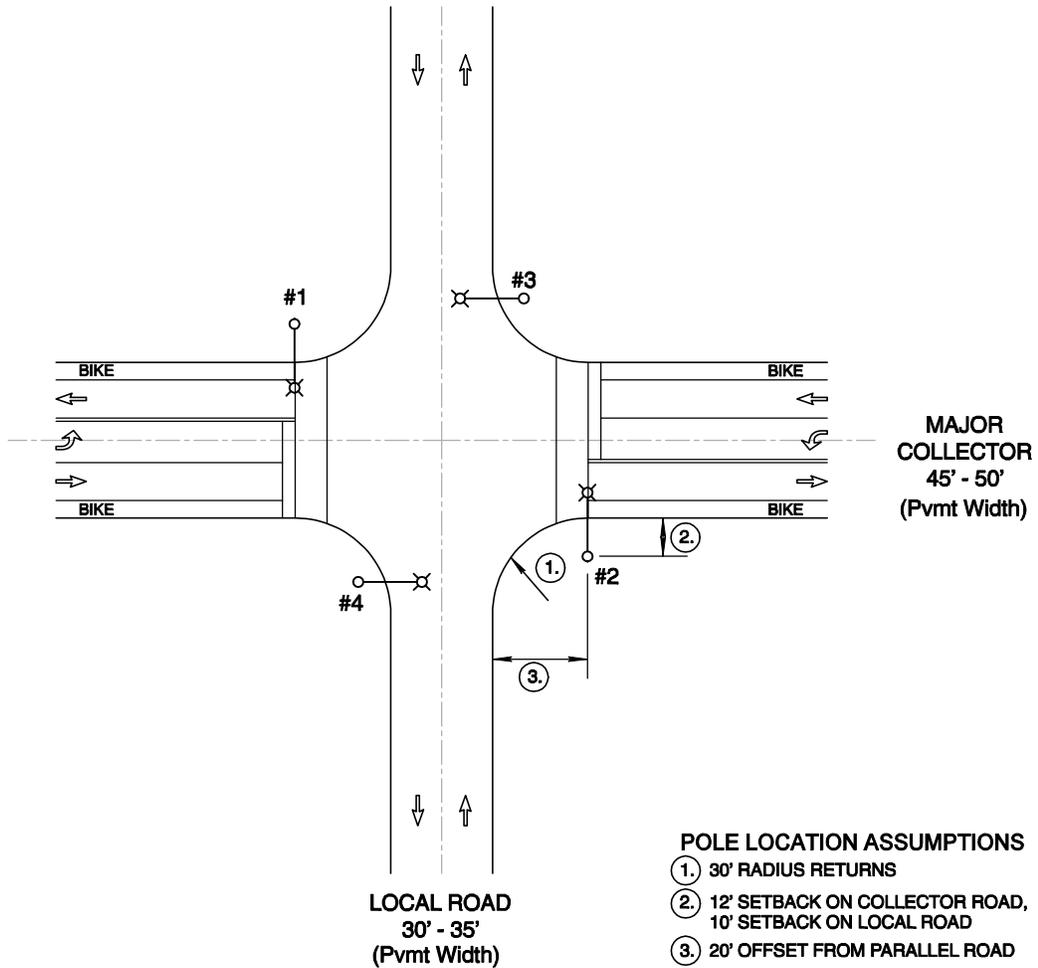
fc: foot-candles

DESIGN NOTES:

1. The designer shall verify that the lighting design meets the required lighting levels using the selected pole equipment and layout.
2. The roadway cross-sections are per the functional classifications designated in the MCDOT Roadway Design Manual Chapter 5.1.
3. All pole layouts shall meet clear zone requirements. For information on clear zone requirements, refer to the MCDOT Roadway Design Manual.
4. The final pole layout and/or any field adjustments shall be approved by the County Traffic Engineer or the designated representative.

**FINAL DRAFT
STREET LIGHTING GUIDELINES**

**INTERSECTION LIGHTING
LAYOUT 9: MAJOR COLLECTOR / LOCAL ROAD**



POLE LOCATION ASSUMPTIONS

- ① 30' RADIUS RETURNS
- ② 12' SETBACK ON COLLECTOR ROAD, 10' SETBACK ON LOCAL ROAD
- ③ 20' OFFSET FROM PARALLEL ROAD

LIGHTING DESIGN CRITERIA:

Intersection Conditions		Intersection Lighting Requirements		Sample Configuration Pole Numbers / Luminaires
Lighting Type on Intersecting Roadways	Pedestrian Activity	Average Illumination (fc)	Uniformity Rate Ave fc / Min fc	
Continuous	Urban - Medium	1.8	4:1	#1-#4 / 250w HPS
Continuous	Rural - Low	1.0	4:1	#1-#2 / 150w HPS
Intersection Only	Urban - Medium	1.4	4:1	#1-#2 / 250w HPS
Intersection Only	Rural - Low	0.9	4:1	#1-#2 / 150w HPS

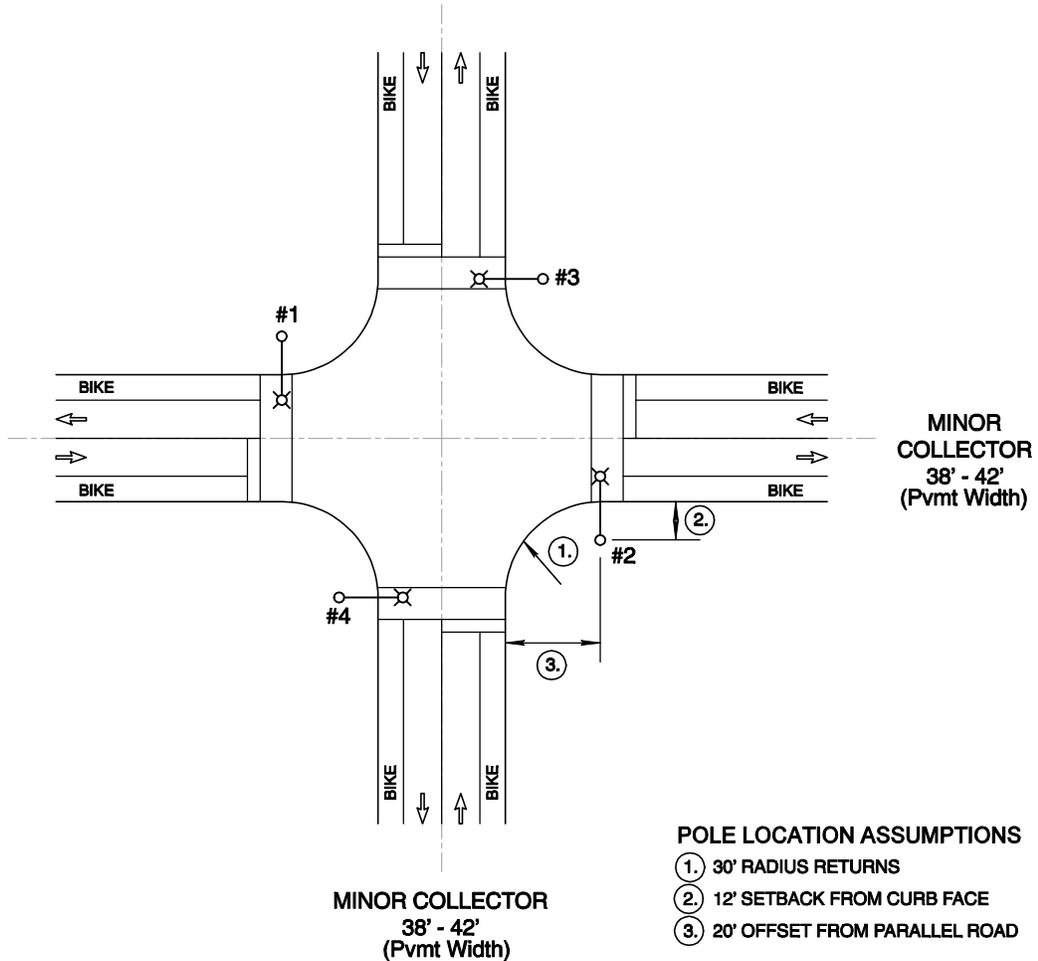
fc: foot-candles

DESIGN NOTES:

1. The designer shall verify that the lighting design meets the required lighting levels using the selected pole equipment and layout.
2. The roadway cross-sections are per the functional classifications designated in the MCDOT Roadway Design Manual Chapter 5.1.
3. All pole layouts shall meet clear zone requirements. For information on clear zone requirements, refer to the MCDOT Roadway Design Manual.
4. The final pole layout and/or any field adjustments shall be approved by the County Traffic Engineer or the designated representative.

**FINAL DRAFT
STREET LIGHTING GUIDELINES**

**INTERSECTION LIGHTING
LAYOUT 10: MINOR COLLECTOR / MINOR COLLECTOR**



POLE LOCATION ASSUMPTIONS

- ① 30' RADIUS RETURNS
- ② 12' SETBACK FROM CURB FACE
- ③ 20' OFFSET FROM PARALLEL ROAD

LIGHTING DESIGN CRITERIA:

Intersection Conditions		Intersection Lighting Requirements		Sample Configuration Pole Numbers / Luminaires
Lighting Type on Intersecting Roadways	Pedestrian Activity	Average Illumination (fc)	Uniformity Rate Ave fc / Min fc	
Continuous	Urban - Medium	1.8	4:1	#1-#2 / 250w HPS OR #1-#4 / 150w HPS
Continuous	Rural - Low	1.2	4:1	#1-#2 / 150w HPS OR #1-#4 / 100w HPS
Intersection Only	Urban - Medium	1.4	4:1	#1-#2 / 250w HPS OR #1-#4 / 150w HPS
Intersection Only	Rural - Low	0.9	4:1	#1-#2 / 150w HPS OR #1-#4 / 100w HPS

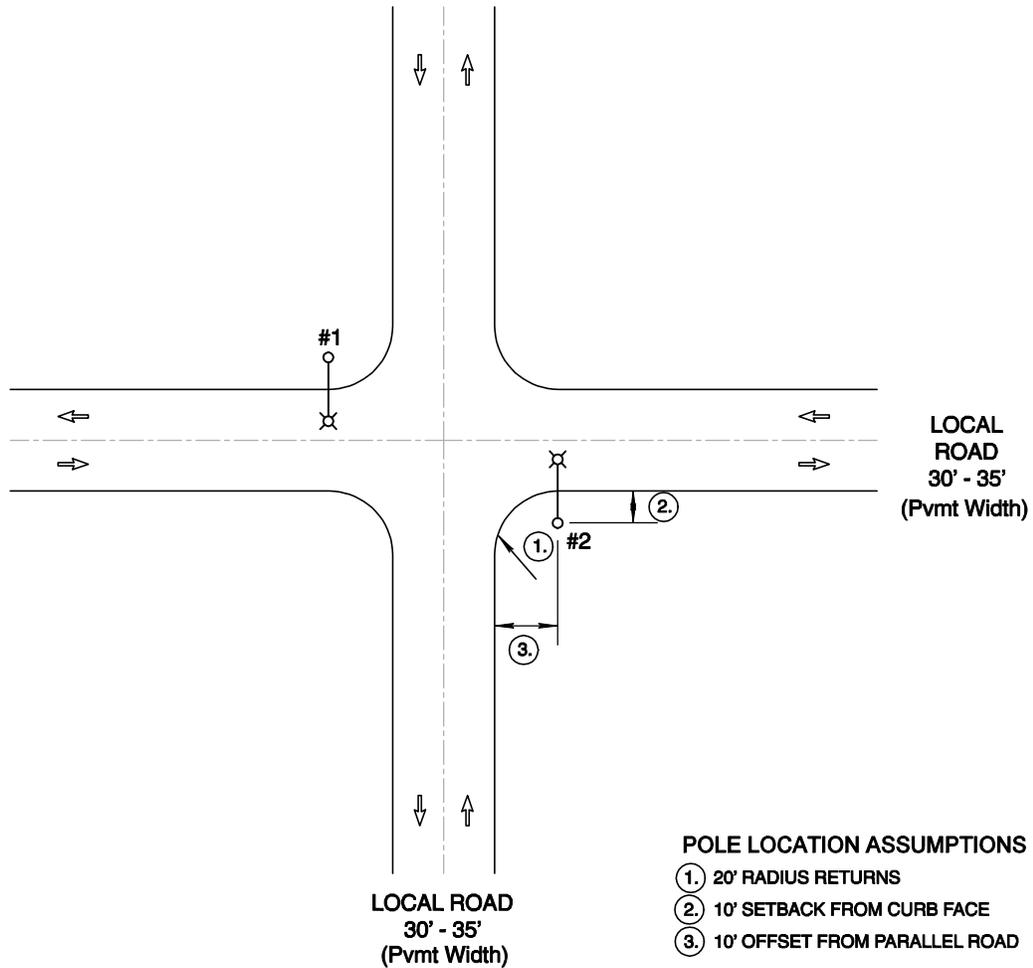
fc: foot-candles

DESIGN NOTES:

1. The designer shall verify that the lighting design meets the required lighting levels using the selected pole equipment and layout.
2. The roadway cross-sections are per the functional classifications designated in the MCDOT Roadway Design Manual Chapter 5.1.
3. All pole layouts shall meet clear zone requirements. For information on clear zone requirements, refer to the MCDOT Roadway Design Manual.
4. The final pole layout and/or any field adjustments shall be approved by the County Traffic Engineer or the designated representative.

**FINAL DRAFT
STREET LIGHTING GUIDELINES**

**INTERSECTION LIGHTING
LAYOUT 11: LOCAL ROAD / LOCAL ROAD**



LIGHTING DESIGN CRITERIA:

Intersection Conditions		Intersection Lighting Requirements		Sample Configurations Pole Numbers / Luminaire
Lighting Type on Intersecting Roadways	Pedestrian Activity	Average Illumination (fc)	Uniformity Rate Ave fc / Min fc	
Continuous	Urban - Medium	1.4	6:1	#1 / 250w HPS OR #1-#2 /150w
Continuous	Rural - Low	0.8	6:1	#1 / 150w HPS OR #1-#2 /100w
Intersection Only	Urban - Medium	1.1	6:1	#1 / 250w HPS OR #1-#2 /150w
Intersection Only	Rural - Low	0.6	6:1	#1 / 150w HPS OR #1-#2 /100w

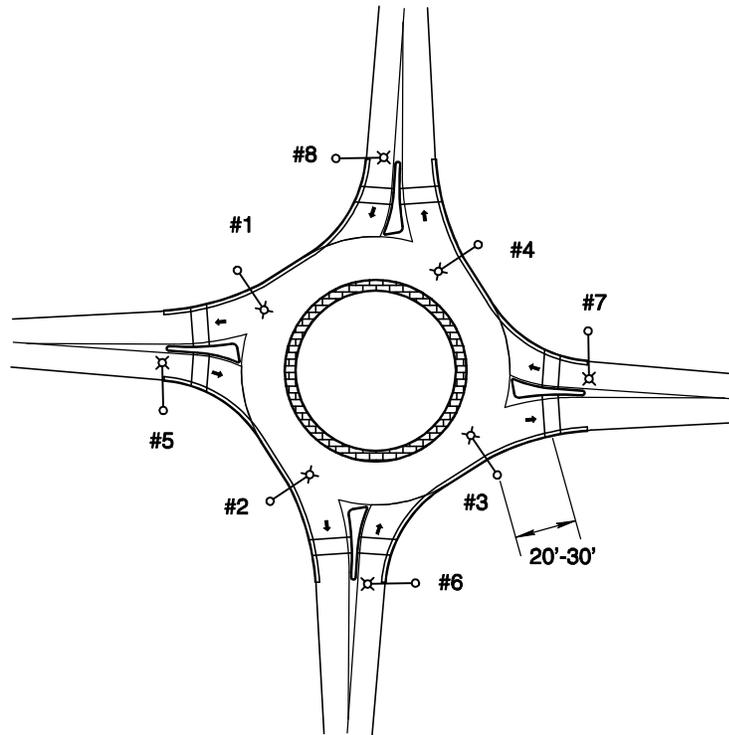
fc: foot-candles

DESIGN NOTES:

1. The designer shall verify that the lighting design meets the required lighting levels using the selected pole equipment and layout.
2. The roadway cross-sections are per the functional classifications designated in the MCDOT Roadway Design Manual Chapter 5.1.
3. All pole layouts shall meet clear zone requirements. For information on clear zone requirements, refer to the MCDOT Roadway Design Manual.
4. The final pole layout and/or any field adjustments shall be approved by the County Traffic Engineer or the designated representative.

FINAL DRAFT
STREET LIGHTING GUIDELINES

INTERSECTION LIGHTING
LAYOUT 12: ROUNDABOUT



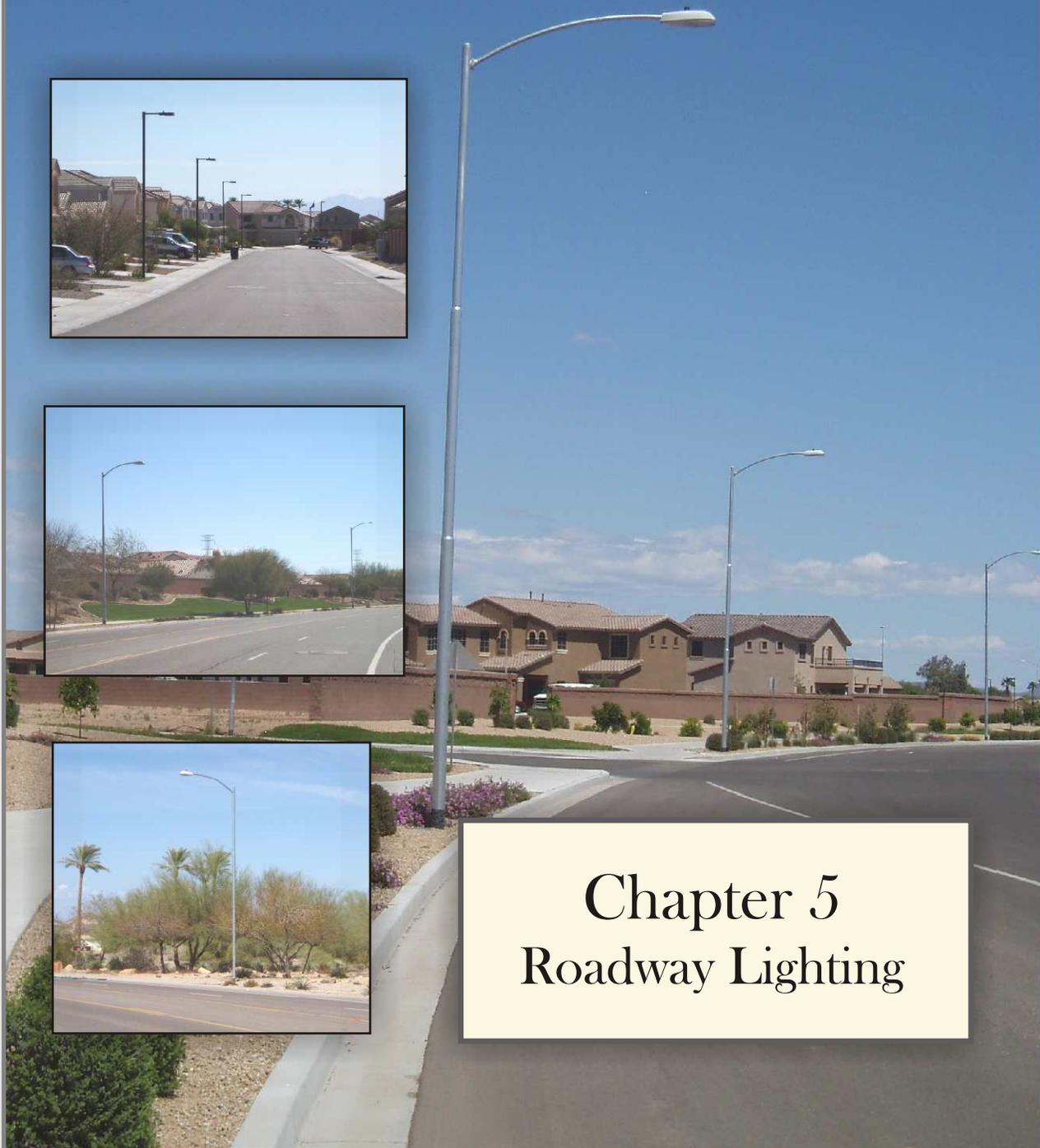
1. Roundabouts should be designed to meet the same lighting level requirements listed in Table 4.1, which depend on the intersecting roadway classifications and pedestrian activity classifications.
2. Lighting levels requirements shall apply to at least 400 feet along the connecting roadways.
3. At roundabouts, light poles should be placed 20 - 30 feet in front of the crosswalk to provide positive lighting contrast.

DESIGN NOTES:

1. The designer shall verify that the lighting design meets the required lighting levels using the selected pole equipment and layout.
2. The roadway cross-sections are per the functional classifications designated in the MCDOT Roadway Design Manual Chapter 5.1.
3. All pole layouts shall meet clear zone requirements. For information on clear zone requirements, refer to the MCDOT Roadway Design Manual.
4. The final pole layout and/or any field adjustments shall be approved by the County Traffic Engineer or the designated representative.



Maricopa County Department of Transportation



Chapter 5 Roadway Lighting

FINAL DRAFT
STREET LIGHTING GUIDELINES

Table 5.1: Continuous Roadway Lighting Level Requirements

RP-8-00 MAJOR	Principal Arterials Road Widths of 95'-120' and Minor Arterials Road Widths of 70'-95'	Criteria for Continuous Lighting Avg Illumination- High Ped: 1.7 fc Med Ped: 1.3 fc Low Ped: 0.9 fc Avg/Min Uniformity: 3:1
RP-8-00 COLLECTOR	Major Collectors Road Widths of 45'-70' and Minor Collectors Road Widths of 30'-45'	Criteria for Continuous Lighting Avg Illumination- High Ped: 1.2 fc Med Ped: 0.9 fc Low Ped: 0.6 fc Avg/Min Uniformity: 4:1
RP-8-00 LOCAL	Local Roads Road Widths of 25'-40'	Criteria for Continuous Lighting Avg Illumination- High Ped: 0.9 fc Med Ped: 0.7 fc Low Ped: 0.4 fc Avg/Min Uniformity: 6:1

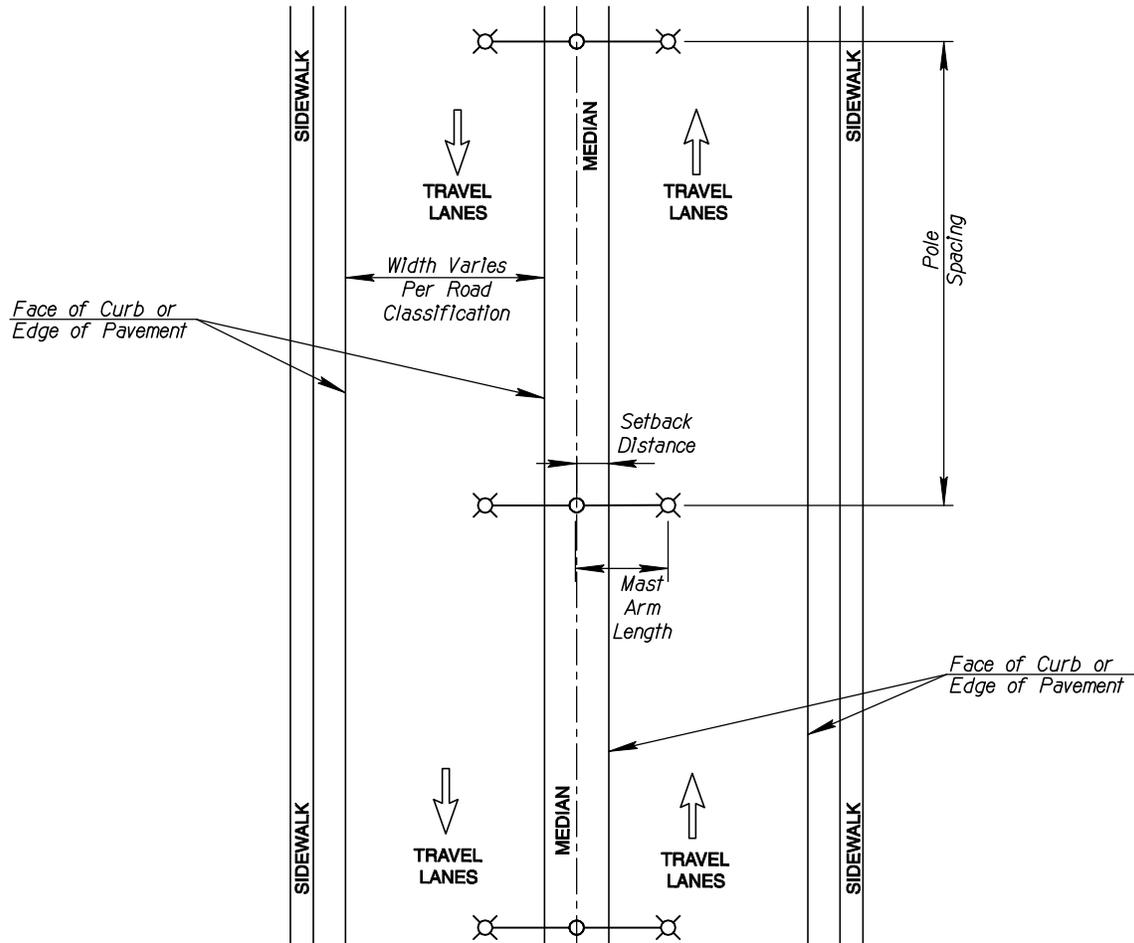
fc – foot-candles

Design Notes:

1. The designer shall verify that the lighting design meets the required lighting levels using the selected equipment and layout.
2. The roadway cross sections are per the functional classifications designated in the MCDOT Roadway Design Manual, Chapter 5.1.
3. All pole layouts shall meet clear zone requirements. For information on clear zone requirements, refer to the MCDOT Roadway Design Manual.
4. The final pole layout and/or any field adjustments shall be approved by the County Traffic Engineer or the designated representative.

FINAL DRAFT STREET LIGHTING GUIDELINES

ROADWAY LIGHTING - MEDIAN LAYOUT



LAYOUT NOTES:

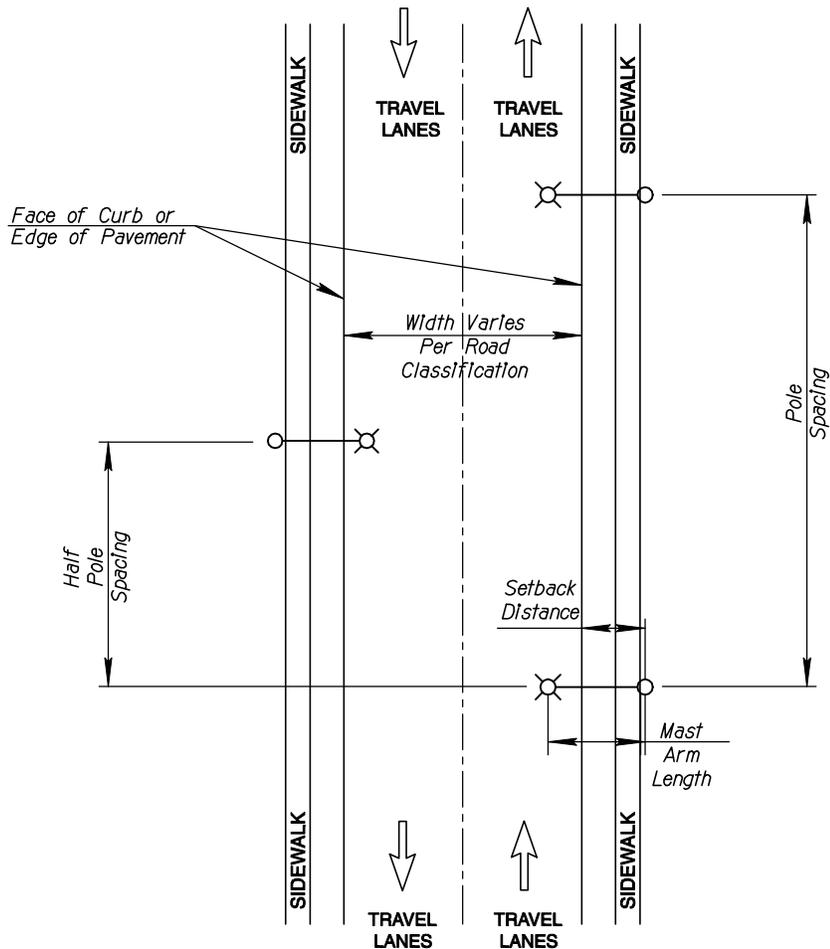
1. This layout is typically used on Principal and Minor Arterial roadway classifications.
2. The setback location should be in the middle of the median.

DESIGN NOTES:

1. The designer shall verify that the lighting design meets the required lighting levels using the selected pole equipment and layout.
2. The roadway cross-sections are per the functional classifications designated in the MCDOT Roadway Design Manual Chapter 5.1.
3. All pole layouts shall meet clear zone and breakaway requirements. For information on clear zone requirements, refer to the MCDOT Roadway Design Manual.
4. The final pole layout and/or any field adjustments shall be approved by the County Traffic Engineer or the designated representative.

FINAL DRAFT STREET LIGHTING GUIDELINES

ROADWAY LIGHTING - STAGGERED LAYOUT



LAYOUT NOTES:

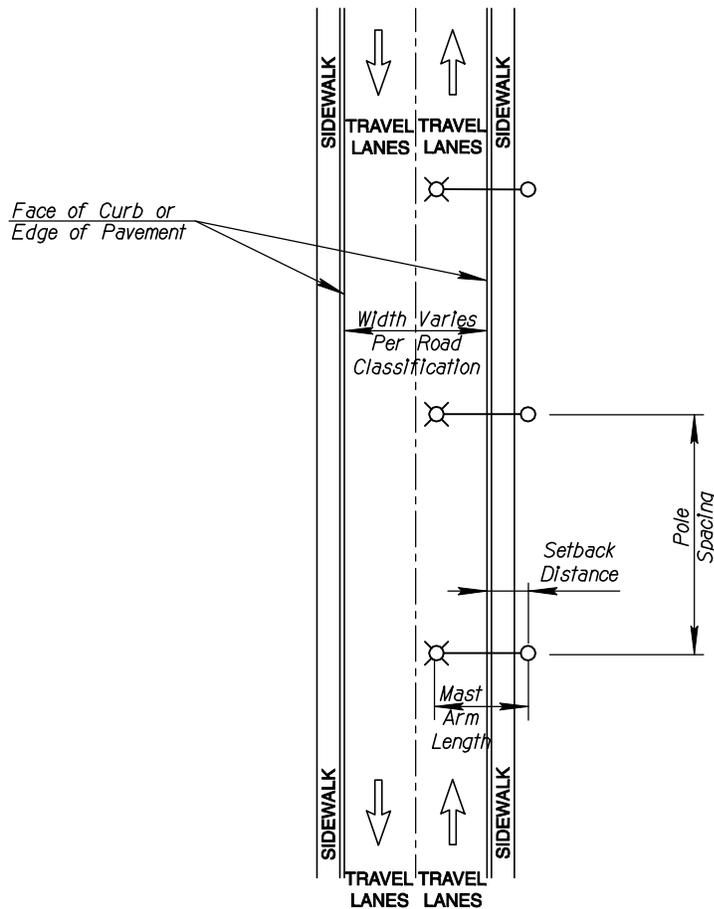
1. This layout is typically used on Arterial and Collector roadway classifications.
2. The setback distance should meet clear zone requirements and be reasonably consistent.

DESIGN NOTES:

1. The designer shall verify that the lighting design meets the required lighting levels using the selected pole equipment and layout.
2. The roadway cross-sections are per the functional classifications designated in the MCDOT Roadway Design Manual Chapter 5.1.
3. All pole layouts shall meet clear zone and breakaway requirements. For information on clear zone requirements, refer to the MCDOT Roadway Design Manual.
4. The final pole layout and/or any field adjustments shall be approved by the County Traffic Engineer or the designated representative.

**FINAL DRAFT
STREET LIGHTING GUIDELINES**

ROADWAY LIGHTING - SINGLE SIDE LAYOUT



LAYOUT NOTES:

1. This layout is typically used on Minor Collectors and Local roadway classifications.
2. The setback distance should meet clear zone requirements and be reasonably consistent.

DESIGN NOTES:

1. The designer shall verify that the lighting design meets the required lighting levels using the selected pole equipment and layout.
2. The roadway cross-sections are per the functional classifications designated in the MCDOT Roadway Design Manual Chapter 5.1.
3. All pole layouts shall meet clear zone and breakaway requirements. For information on clear zone requirements, refer to the MCDOT Roadway Design Manual.
4. The final pole layout and/or any field adjustments shall be approved by the County Traffic Engineer or the designated representative.

Continuous Roadway Lighting Sample Pole Spacing

General Notes:

1. The pole spacing data provided below are intended to be used as guidance. The designer shall perform a photometric analysis for each design to verify that the appropriate lighting level requirements, provided in Table 5.1, are satisfied using the individual project constraints.
2. The pole spacing data provided below are based on the following criteria:
 - a. Medium pedestrian activity criteria
 - b. Light loss factor of 0.70
 - c. Photometrics of the APS standard Cobra fixture
 - d. MCDOT urban cross sections provided in Chapter 5-1 of the Roadway Design Manual.

Table 5.2: Principal Arterial Sample Pole Spacing

PRINCIPAL ARTERIAL:	Required Lighting: 1.3 Avg fc; 3.0 Avg/Min Uniformity				
<i>Layout Type</i>	<i>Wattage</i>	<i>Mounting Height</i>	<i>Mast Arm Length</i>	<i>Setback Distance</i>	<i>Pole Spacing</i>
Median*	400	35	8	7*	195
Median*	250	35	20	7*	160
Median*	250	35	8	7*	160
Staggered	400	35	20	13	185
Staggered	250	35	20	13	165
Staggered	250	35	8	13	120

* Based on MCDOT standard median width of 14' back to back of curb

Table 5.3: Minor Arterial Sample Pole Spacing

MINOR ARTERIAL:	Required Lighting: 1.3 Avg fc; 3.0 Avg/Min Uniformity				
<i>Layout Type</i>	<i>Wattage</i>	<i>Mounting Height</i>	<i>Mast Arm Length</i>	<i>Setback Distance</i>	<i>Pole Spacing</i>
Median*	400	35	8	7*	180
Median*	250	35	20	7*	135
Median*	250	35	8	7*	140
Staggered	400	35	20	13	185
Staggered	250	35	20	13	200
Staggered	250	35	8	13	155

* Based on MCDOT standard median width of 14' back to back of curb

FINAL DRAFT
STREET LIGHTING GUIDELINES

Table 5.4: Major Collector Sample Pole Spacing

MAJOR COLLECTOR:		Required Lighting: 0.9 Avg fc; 4.0 Avg/Min Uniformity			
<i>Layout Type</i>	<i>Wattage</i>	<i>Mounting Height</i>	<i>Mast Arm Length</i>	<i>Setback Distance</i>	<i>Pole Spacing</i>
Staggered	250	35	20	13	395
Staggered	250	35	8	13	300
Staggered	150	35	20	13	220
Staggered	150	35	8	13	155
Single Sided	250	35	20	13	200
Single Sided	250	35	8	13	150
Single Sided	150	35	20	13	105
Single Sided	150	35	8	13	75

Table 5.5: Minor Collector Sample Pole Spacing

MINOR COLLECTOR:		Required Lighting: 0.9 Avg fc; 4.0 Avg/Min Uniformity			
<i>Layout Type</i>	<i>Wattage</i>	<i>Mounting Height</i>	<i>Mast Arm Length</i>	<i>Setback Distance</i>	<i>Pole Spacing</i>
Staggered	250	35	20	10	420
Staggered	250	35	8	10	365
Staggered	150	35	20	10	240
Staggered	150	30	20	10	265
Staggered	150	30	8	10	200
Single Sided	250	35	20	10	210
Single Sided	250	35	8	10	185
Single Sided	150	35	20	10	120
Single Sided	150	30	20	10	135
Single Sided	150	30	8	10	105

Table 5.6: Local Road Sample Pole Spacing

LOCAL ROAD:		Required Lighting: 0.7 Avg fc; 6.0 Avg/Min Uniformity			
<i>Layout Type</i>	<i>Wattage</i>	<i>Mounting Height</i>	<i>Mast Arm Length</i>	<i>Setback Distance</i>	<i>Pole Spacing</i>
Staggered	150	30	20	10	370
Staggered	150	30	8	10	305
Staggered	100	30	20	10	225
Staggered	100	30	8	10	180
Single Sided	150	30	20	10	175
Single Sided	150	30	8	10	150
Single Sided	100	30	20	10	110
Single Sided	100	30	8	10	90

700 ILLUMINATION

701. POLICY STATEMENT

The purpose of this policy is to provide general guidance as to where ADOT would provide roadway lighting.

710. IMPLEMENTING STATEMENT

The purpose of highway illumination is to promote orderly and safe movement of nighttime traffic by artificially illuminating the roadway. Engineering judgment should be used in determining if lighting will be installed. Cost and readily available electrical service, are major factors in the determination in light installations.

The guideline conditions are for the purpose of establishing a guide on which lighting may be considered. However, the meeting of the guideline conditions does not obligate ADOT to provide lighting. Lighting will be installed by the State only where engineering judgment indicates there are sufficient traffic volumes and/or collisions to satisfy one or more of the conditions set forth where illumination would enhance highway safety.

721 Procedures

721.1 Continuous Freeway Illumination

When practicable, median lighting is preferred. The following data is used as part of an evaluation to appraise the need for freeway illumination:

- (1) Estimated average daily traffic at the time of the opening of the freeway to traffic, for the freeway lanes, each ramp, and each crossroad. This shall be shown on the appropriate traffic volume movement forms.
- (2) Answers to the following questions for freeway projects which are in built-up areas:
 - a. Is lighting on a city street grid visible from ground level or elevated freeways?
 - b. Are the cross streets lighted up to one-half (1/2) mile in each direction from the freeway?
 - c. Are three or more successive interchanges located with an average spacing of three (3) miles or less?
 - d. Is the area under consideration urban?
 - e. Are there three lanes or more in each direction?
 - f. What is the night time number of crashes vs. the day time number of crashes for that section in the past three (3) years?

721.2 Complete or Partial Interchange Illumination

The following data is used as part of an evaluation to appraise the need for complete or partial interchange illumination:

- a. Lighting of intersecting city street visible from ground level or elevated freeways.
- b. Presence of commercial development on the interchange.
- c. The nighttime number of crashes vs. the day time number of for that section in the past three (3) years?

721.3 Freeway to Freeway interchange Illumination

Freeway to Freeway interchange illumination shall utilize high-mast, high pressure sodium illumination.

721.4 Special Considerations

Continuous, complete, or partial interchange lighting, and pedestrian walkway bridge lighting, may be considered to be justified where the local governmental agency finds sufficient benefit in the forms of convenience, safety, policing, community promotion, public relations, etc., to wholly finance the installations, maintenance, and operation of the lighting facilities.

721.5 Conventional Highway Lighting Guidelines

a) Intersection Lighting

The following data is used to evaluate the need for conventional highway lighting:

1. Pedestrian and vehicular traffic counts.
2. Availability of electrical service. Where electrical service is available only at excessive cost, consideration should be given to deferment of the installation, unless a benefit/cost analysis indicates a ratio of one or greater.
3. Summary of crashes for a three (3) year period.

b) Continuous Lighting on Conventional Highways

Continuous lighting on conventional highways is considered to be justified where local agencies find sufficient benefit in the forms of convenience, safety, policing, community promotion, public relations, etc. to pay the cost of installation, maintenance, and operation of the lighting. Continuous lighting may be permitted by the State after the consideration of the following conditions:

1. Is lighting on a city street grid visible from highway?
2. Are the cross streets lighted up to one-half (1/2) mile in each direction from the highway?

3. Is the area under consideration urban?
4. What is the night time number of crashes vs. the day time number for that section in the past three (3) years?

c) Intersections on Conventional Highways

Illumination at intersections on conventional highways should be considered using the following data:

1. Pedestrian and vehicular traffic counts.
2. Availability of electrical service. Where electrical service is available only at excessive cost, consideration should be given to deferment of the installation, unless a benefit/cost analysis indicates a ratio of one or greater.
3. An average of three or more crashes per year over the three most current years have occurred under conditions other than daylight.
4. The intersection is signalized.
5. The intersection has raised channelization and/or complex geometrics.

722. Provisions for Future Lighting

722.1 Structures

Provision for future lighting shall be made on structures which are within urban areas and on others which may require lighting in the future.

722.2 Roadway

Underground conduit roadway crossings and pull boxes should be installed under a highway construction contract where it appears that lighting may be justified in the future.

722.3 Signalization

Intersections which are projected to be signalized, should use light poles that can be employed as future traffic signal supports.

723. General Design Approach

723.1 ADOT Standard Drawings should be used unless otherwise specified.

723.2 Illuminance

Illuminance shall be the primary design method practiced for ADOT projects.

723.3 Techniques of Illumination Design

ADOT or the designer may require veiling luminance calculations in lieu or in addition to illuminance calculations for design.

723.4 Level and Uniformity of Illuminance and Luminance

Standard lighting shall be a High Pressure Sodium light source.

Wattage typically is :

High Mast – 400watt.

Vertical Offset installations – typically 250 watt and not to exceed 400 watt.

Horizontal Mount – typically 150 watt and 250 watt, not to exceed 400 watt.

724. Illumination Responsibility and Financing

The Arizona Department of Transportation's participation in financing illumination on State highways will be as set forth below. If local governmental agencies desire more expensive equipment than that normally used by the State, the additional cost must be financed by the local agency. On Federal-Aid projects, Federal participation will be requested when the desirability of providing lighting is established in accordance with the warrant conditions set forth in this guide.

724.1 Freeways

The cost of installing and maintaining lighting on freeways will be borne entirely by the State. The State financing will include all necessary lighting on the freeway and connecting ramps, including where necessary, lighting under structures. If other governmental agencies desire additional lighting, the installation, maintenance, and operation costs must be borne by the sponsoring agency.

724.2 Existing Grade Intersections

The installation of lighting at intersections at grade will normally be financed jointly by the State, the City, and/or County in a manner to be determined by the agencies and stated in a formal agreement between the parties involved. Maintenance and operation costs will normally be assumed by the local agency. The need for lighting will be established in accordance with the warrant conditions stated in this guide.

724.3 New At Grade Intersections

The installation cost of lighting at intersections at grade on new construction will be borne entirely by the State. The maintenance and operation costs of lighting of new grade intersections will normally be assumed by the local agency. The need for lighting will be established in accordance with the guideline conditions set forth in this policy.

724.4 Special Consideration Lighting

Where engineering studies show special conditions existing on roadways other than freeways, the State may assume the total financial responsibility for lighting, if detailed study indicates that such lighting will correct the deficiency until major reconstruction can be undertaken. The need for lighting will be established in accordance with the guideline conditions set forth in this Policy.

724.5 Lighting by Other Agencies

When fixed lighting on State highways is desired by other governmental agencies, lighting may be permitted, provided the following conditions are met:

- a. The State will not be obligated to bear any portion of the costs for its construction, maintenance, or operation.
- b. Full authority is retained by the State to exercise control in all matters relating both to design and operation of such installations.
- c. Any such installation shall be subject to approval by the State, and will require an encroachment permit.
- d. The proposed lighting shall in no way detract from or nullify the effectiveness of any lighting placed by the State, or interfere with the safe and orderly movement of traffic.
- e. On expressways the installations must incorporate metal standards with underground wiring. On conventional roadways these installations may be made on existing wood poles with overhead wiring.

730. APPROVAL

The installation of illumination shall be approved by the State Traffic Engineer.

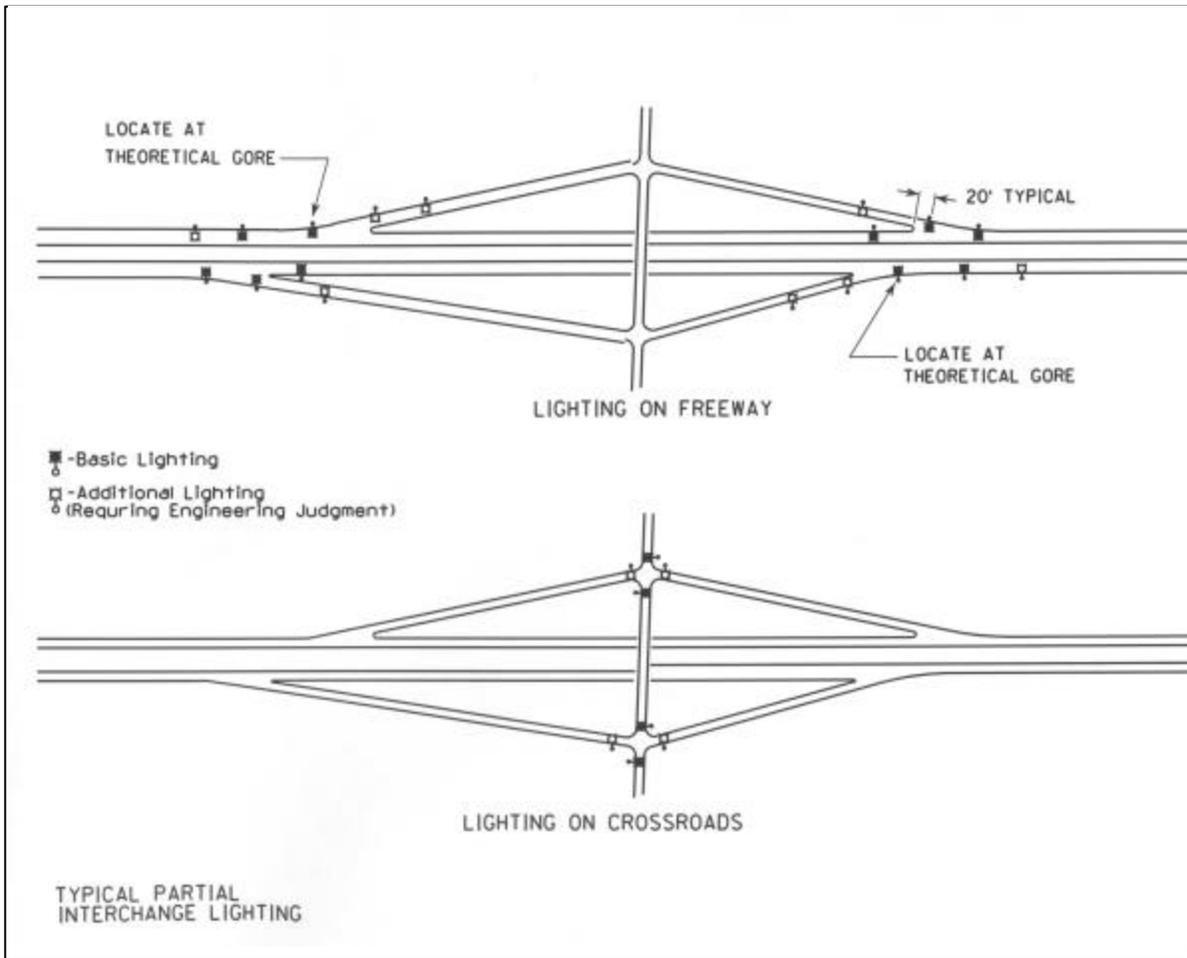


FIGURE 1

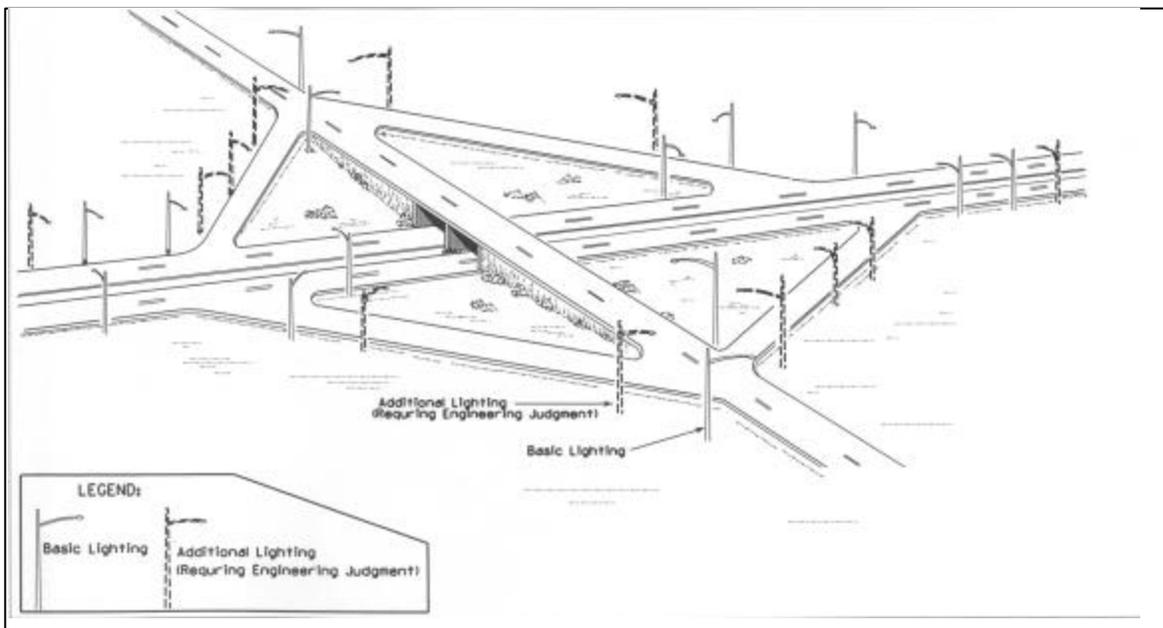


FIGURE 2

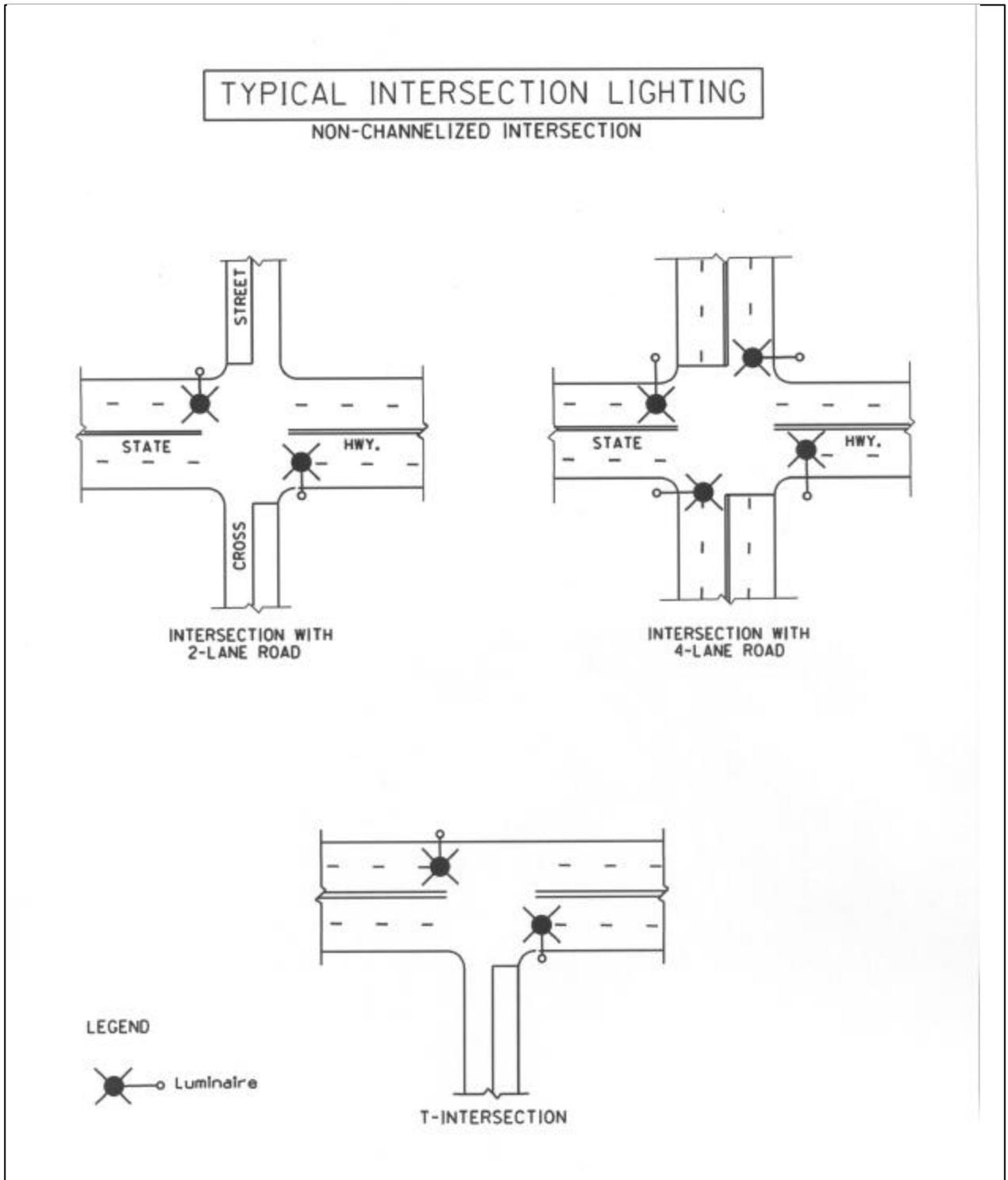


FIGURE 3

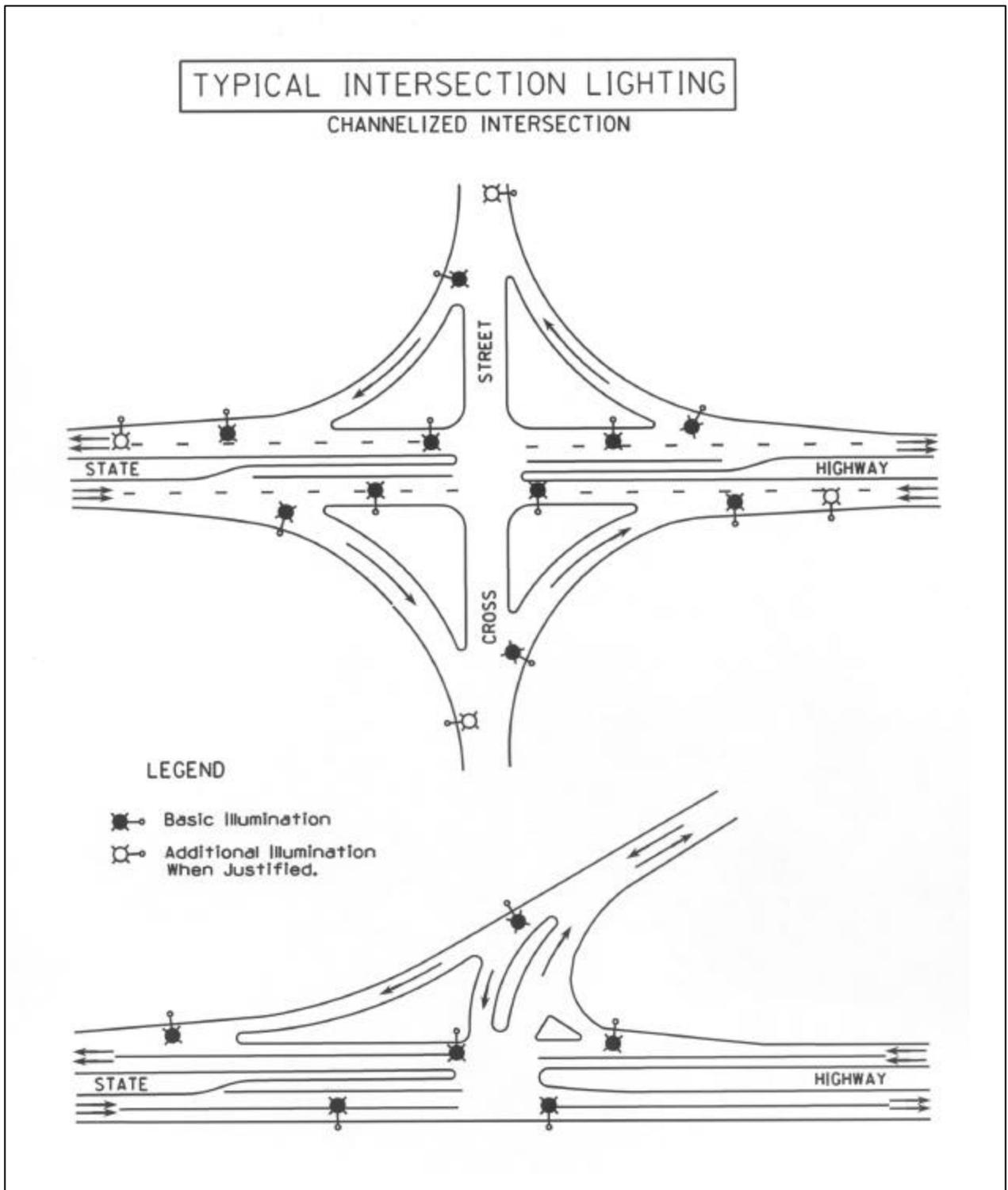


FIGURE 4

SANTA CRUZ COUNTY PUBLIC WORKS ROADS AND STREETS DEPARTMENT

POLICY, GUIDE AND PROCEDURE STREET LIGHTING POLICY

PGP 2002-01

EFFECTIVE DATE: January 1, 2003

PARAGRAPH:

1. Purpose
2. Background
3. Definitions
4. Description
5. Guidelines
6. References
7. Authorization

1. PURPOSE

The purpose of this policy is to provide a standard procedure to evaluate the need to install street lights. This policy also includes a process to remove or reassign the responsibility and cost of existing street lights back to the constituents.

2. BACKGROUND

The Santa Cruz County Public Works Department has the responsibility to install and maintain street lights on County roads. After a recent review of the previous procedures to install street lights, it was determined a new policy on street light installation should be adopted as a policy to install street lights on County roads.

3. DEFINITIONS

STREET LIGHTS----Generally a light mounted on a pole that is placed alongside a road to provide lighting to improve the safety of drivers and pedestrians who use the roads at night.

COLLECTOR ROADS----Collector roads generally serve travel needs associated with intracounty rather than statewide. According to AASHTO's Policy on Roadway Design, Collector roads are also subclassified into Urban and Rural collectors. However, for this purpose, the primary function of a county collector road serves to connect local roads onto arterials. Speeds on collector roads are generally higher than 25 mph for local streets.

LOCAL ROADS ---- Santa Cruz County has urban or rural local roadways that primarily serves as access to residential neighborhoods, businesses, or other abutting property. Speed zones on local roads that have not been established by a traffic engineering study, are either posted or unposted with a prima-facie speed limit of 25 mph on paved sections. Local roads are dedicated County right-of-way, and are accepted into the Santa Cruz County public road maintenance system.

4. DESCRIPTION

For descriptive purposes, street lights when properly located and installed, are extremely beneficial to the driver and pedestrian by enhancing awareness during nighttime conditions. These devices are mounted on metal or wood posts. Currently, all of the existing street lights on County roads, are maintained under contract by the Citizen Utilities Power Company. The County has determined that a policy is needed to evaluate each request for street light installation.:

5. STREET LIGHT GUIDELINES (SLG)

Based on the need to provide a street light policy, the following street light guidelines have been established to provide street lights at the following locations:

SLG 1:

At any intersection, upon receiving a request, where it is found to have three (3) or more nighttime accidents during a recent period of 12 consecutive months and listed in the most recent version of the Santa Cruz County's Major Streets and Routes Plan and/or County Road Atlas.

SLG 2:

At any intersection consisting of 2 Major Roadways where both are listed on the most recent version of the Santa Cruz County's Major Streets and Routes Plan, and have a combined Average Daily Traffic (ADT) total of 5000 or greater entering the intersection during a 24 hour period, and where five (5) or more accidents have occurred over a five year period.

SLG 3:

At all private developments, commercial and residential that meet the guidelines of this policy and in accordance with the recent ASSHTO roadway design manual and approved construction standards. Lighting provided by private developments, commercial, and residential shall be coordinated with Planning and Zoning Department.

SLG 4:

At all marked crosswalks and school crosswalks located on public streets. If a crosswalk is deemed necessary, prior to programmed street light installation, a traffic investigation shall be conducted to coordinate the installation of the crosswalk and street light.

SLG 5:

At all new signalized intersections and existing signalized intersections.

SLG 6:

At specific locations adjacent to a roadway segment or at intersections, where street lights will assist in the prevention of crime. A traffic study in conjunction with police reports shall be conducted to determine the need for design and installation of the street light(s).

SLG 7:

Street lights shall be installed in neighborhoods, where special funding is made available and supported by a traffic investigation.

SLG 8:

At locations considered by the Board of Supervisors, and supported by a traffic investigation to determine the need for a street light.

Guidelines for Removal of Street Lights

The process to remove unwanted street lights is based on current guidelines and public safety needs. This process in removing street lights is shown below:

1. The existing street light location shall be listed on the current version of the Santa Cruz County Major Roads and Streets Plan, *and*
2. Have a combined Average Daily Traffic (ADT) total of less than 150 vehicles or less than 25% of the total ADT at nighttime, during a 24 hour period, *and*
3. Where accidents was not the warranting factor prior to installation, *and*
4. Where the Safe Stopping Sight Distance (SSSD) is more than the measured sight distance based on the 85th percentile approach speeds, *and*
5. Where a traffic investigation has determined the roadway location is not a high crime location.

Re-Assignment of Street Lights Back To The Constituents

If the traffic investigation process of evaluating existing street light finds an existing street light does not meet the minimum guidelines, then the process for removal is based on the following conditions:

1. Removal is based on a traffic investigation report with recommendations for the Board of Supervisors to review and approve, *and*
2. If the Board of Supervisors approves the removal of a street light based on a traffic study recommendation, the constituent(s) will be notified of the pending removal of the street light and a time limit of 30 days for re-assignment or actual turnoff, *and*
3. The constituent(s) will be given the option of maintaining the existing street lights on a prorated cost assessed for one year. The assessed yearly value will be increased by 1/12 of yearly cost per month for the total year. The account and payment for that particular street light will be the responsibility of the constituent(s) at the end of the 12 month period.

Maintenance and Operation of Street Lights

If **ONE OR MORE** of the street light guidelines listed above is met, as determined by a traffic investigation, and approved by the Board of Supervisors, the cost associated for installation and maintenance of a street light will be paid by the Santa Cruz County Public Works Department. If **NONE**, of the street light guidelines listed above is met, then the Public Works Department will provide support to the constituent(s) and the constituent(s) will be responsible for all of the costs involved in the actual installation and maintenance of the street light.

Once the site has been determined by a traffic investigation to meet the guidelines for street light installation, the location and work order will be forwarded to the local electrical company (Citizens Utilities) for implementation. This process of establishing a process to install street lights is called, "Dusk to Dawn Street Light Program". Contact is made with the Citizens Utilities Public Improvement Coordinator. A field meeting is scheduled at the location of planned street light and the following items shall be discussed:

- a.) The location and type of pole is discussed.
- b.) Clear zone criteria is evaluated,
- c.) Proximity of the pole to nearest light source is determined,
- d. Wattage of the light fixture to be used,
- d.) Mast arm and direction from pole,
- e.) Determine the address of the street light location on an official letter to Citizens Utilities,
- f.) Contract is finalized and work is scheduled,
- g.) Copy is sent to finance for receiving and paying the monthly utility bills.

6. REFERENCES

MUTCD:	2001 Millennium Edition
SCC Public Works:	Past Historical Data and Practice
AASHTO:	A Policy On Geometric Design Of Highways And Streets, 1990 Edition.

7. AUTHORIZATION:

COUNTY MANAGER: _____

PUBLIC WORKS DIRECTOR: _____

ITEM 6

**IMPORTANT COUNTY IMPROVEMENT DISTRICT DOCUMENTS
AND RELATED PROCESSES**

If there is a contradiction with the Arizona State Statutes, the Arizona State Statutes will prevail. Arizona Revised Statutes (“**A. R. S.**”) Title (“**Ttl**”) 48, Chapter (“**Ch**”) 6, Sections (“**§§**”) 48-901 *et seq* and currently (August 2000) ranging through Section § 48-1070.

PETITION TO ESTABLISH A.R.S. §§ 48-903 to 48-905

1. Once formed, an Improvement District is a political subdivision of the State of Arizona as presented by the Arizona Constitution Article XIII §7 County Improvement Districts, including Domestic Districts Ttl 48, Ch 6, Art. 4, §§ 48-1011 to 48-1019 [see also Ttl 48, Ch 6, Art 1 § 48-903 (D and E) and § 48-910]. Improvement Districts are subject to the State Statutes regarding Notices, Open Meetings, Document Productions and other appropriately applicable or prescribed statutes applicable to such political subdivision.
2. Authorization for Improvement District [A. R. S. § 48-902]
 - a. Purpose and Areas of land excluded and boundaries set. [A. R. S. § 48-909; see also §§ 48-902 - 48-906]
3. Petition to establish district [A. R. S. § 48-903]
 - a. Formed and prepared (By staff of Public Works, petitioners or Private Counsel)
 - b. Bond required [A. R. S. § 48-904]
 - c. At least 51% of persons owning real property or 51% of real property within the District required or by a majority of the persons owning real property within the proposed District in order to be presented to Board of Supervisors [A. R. S. § 48-903]
 - d. Petitions shall include a legal description and boundaries generally prepared by a Registered Land Surveyor.
 - e. Each Petition should be verified. [A. R. S. § 48-903(F)]
 - f. Petitions are reviewed by staff
 - g. If Petitions are deemed sufficient, such Petitions are presented to the Board of Supervisors for review and setting a hearing for action unless the Petitions are signed by all real property owners, in which even summary formation may occur. [A. R. S. § 48-905]
4. Hearing on petition [A. R. S. § 48-905]
 - a. Hearing is to be no later than forty (40) days after presentation of Petitions [A. R. S. § 48-905(A)]
 - b. Notice of Hearing to be published in newspaper twice at least 10 days prior to hearing and 1 week apart [A. R. S. § 48-905(B)]
 - c. Notice of Hearing to be mailed to property owners at least 20 days before hearing. (Names and Addresses from Tax rolls)
 - d. Hearing is held, findings are made and action is taken to form as requested, formation for part or additional or denied. [A. R. S. § 48-906]
5. Review of Board of Supervisors Action [A. R. S. § 48-907]

PETITION TO INCUR EXPENSE

A.R.S. §§ 48-909 to 48-915

5. A petition to incur is drafted which defines the type and purpose(s) of proposed acquisitions and/or the improvements to be constructed (paving, water, sewer, etc.) [A.R.S. §§ 48-909 and 48-915]
6. Appoint District Engineer [A. R. S. § 48-914]
 - a. Request for Proposals - Engineering Services (generally with proposed Contract forms
 - vii. Receive Proposals
 - viii. Select Proposals
 - b. Bid process, alternate to Request for Proposals
 - ix. Prepare document and advertise for bids
 - x. Bids opened and awarded at Board of Supervisors meeting
 - xi. Engineer signs contract and becomes District Engineer
 - xii. Engineer prepares Preliminary Plans and Specifications and Cost Estimate
 - xiii. Engineer prepares Petition to incur Expense
3. Petition to Incur Expense [A.R.S. § 48-915]
 - a. District Engineer prepares petition with Estimated Cost and proposed improvement [A.R.S. § 48-914]
 - b. Need at least 51% of the property fronting on proposed improvement
 - c. Affidavit of Sufficiency signed by property owner circulating petitions [A.R.S. § 48-915]
 - d. Petitions verified by District Engineer
 - e. Present petitions to Board of Supervisors and set Hearing Date
 - f. The maximum amount of the proposed assessment shall be no more than \$1.50 per \$100.00 of assessed valuation.
 - g. Resolution of Intention and Notice of Proposed Improvement prepared (usually by staff and presented to Board of Supervisors for approval [A.R.S. §§ 48-912 and 48-916]
 - h. Staff posts and mails to property owners the Notice of Proposed Improvement [A.R.S. § 48-912]
 - i. 20 day protest period during which protests can be filed [A.R.S. §§ 48-917 and 48-918]
 - k. Hearing is held [A.R.S. § 48-918]

PROJECT PHASE

1. Ordering work and inviting bids [A.R.S. § 48-919]
 - a. Resolution ordering work and inviting bids [A.R.S. § 48-919]
 - b. Publish a notice of passage of the Resolution ordering the work and inviting bids 2x or 1x in a weekly or semiweekly newspaper [A.R.S. § 48-919 (C)]
 - c. Post notice on or near the door of the meeting place of the Board of Supervisors for 5 days prior to bid opening [A.R.S. § 48-919 (C)]
 - d. The notice shall state the time within which proposals may be filed with the clerk, which shall not be less than 10 days from the date of the first publication of the notice [A.R.S. § 48-919 (C)]
 - e. Bids shall be submitted, accompanied by a bond, payable to the district for an amount not less than 10% of the aggregate proposal [A.R.S. § 48-922]
 - f. Receive bids-open and declare at public meeting, Board of Supervisors award contract to lowest and best bid [A.R.S. § 48-923]
 - g. Notice of the Award of Contract shall be published 2x in a daily or 1x in a weekly or semiweekly newspaper [A.R.S. § 48-923]
 - h. 15 day protest period from the date of the first publication [A.R.S. § 48-923(B)]

- i. Within 20 days after the date of the first publication, if no objections have been filed, the successful bidder shall enter into a contract according to his bid [A.R.S. § 48-923(C)]
- j. Contract with Contractor prepared and executed [A.R.S. § 48-924]
- k. Performance and Payment Bond provided by Contractor [A.R.S. § 48-925; A.R.S. Tit 34, Ch 2, Art 2, § 34-221 *et seq*, A.R.S. § 33-1003]
- l. Contract with legal description with progressive payment bond are recorded prior to work commencing [A.R.S. § 33-1003]

ASSESSMENT DIAGRAMS TO SALE OF BONDS

A.R.S. § 48-33 and/or 48-981 - 48-988

1. Assessment Diagrams and Hearing [A.R.S. § 48-927]
 - a. District Engineer generates the Assessment Diagram showing how the assessments are to be distributed [A.R.S. § 48-922]
 - b. Resolution approving the Assessment Diagrams [A.R.S. § 48-922(A)]
 - c. Assessment diagram shall be delivered to the office of the Superintendent of Streets [A.R.S. § 48-927 (A)]
 - d. The Superintendent of Streets shall enter Assessments [A.R.S. § 48-927(C-G)]
 - e. The assessments and warrant if applicable, shall be recorded and shall be a first lien subject to general taxes and prior special assessments [A.R.S. § 48-927 (H & I)]
 - f. Notify Board of Supervisors that Assessments are recorded
 - g. Follow procedures for delivery of Assessments (and Warrant if applicable) [A.R.S. § 48-928]

2. Cash Demand and Payment
 - a. Notice to each property owner (as per current tax rolls) shall be mailed showing the amount of the assessment for their parcel known as "Cash Demand" [A.R.S. §§ 48-916, 48-981 and 48-983]
 - b. Notice of Hearing for assessments are also mailed with "Cash Demands" [A.R.S. § 48-928 (E)]
 - c. Such notice of hearing shall also be published [A.R.S. § 48-928 (E)]
 - d. Superintendent of Streets shall make an affidavit of the mailing [A.R.S. § 48-928(E)]
 - e. Hearing to be set not less than twenty (20) days from the assessment recording [A.R.S. § 48-928(E)]
 - f. If Board of Supervisors find that the assessment has not been fairly apportioned, it shall modify the amounts of the assessments and may order assessments to be recomputed. [A.R.S. §§ 48-928 (F) and 48-932]
 - 1) No assessment or assessments may be increased in such a manner which causes the total assessment for all work and expenses to exceed the stated total amount set forth on the engineer's official estimate.
 - g. Issue Treasurer's Return of Assessments and Certified list of unpaid Assessments to Clerk of the Board within 40 days of "Cash Demand" showing cash received [A.R.S. § 48-935 (A)]

3. Sale of Bonds
 - a. The board of supervisors awards a sale of bonds for unpaid assessments [A.R.S. § 48-935(C)]
 - b. Bonds are in a presented form [A.R.S. § 48-936]
 - c. Resolution is passed by the Board ordering Issuance and Sale of Bonds [A.R.S. §§ 48-933 - 48-935]
 - d. Adjust Bond issue size for Cash Collection information must be made available to bidders [A.R.S. § 48-935]
 - e. The interest on the Bonds shall not exceed the rate specified in the Resolution of Intention [A.R.S. § 48-935 (D)]

- f. Receive Bond Bids (may be public or private service) [A.R.S. § 48-935]
- g. Award Bond bids - same day bid are received
- h. Execute documents necessary for closing of bonds
- i. Payments on bonds are due June 1 and December 1 of each year and payable by January 1 or July 1 until assessment is fully paid [A.R.S. § 48-935(E)]
- j. Issue Notice to Proceed to Contractor

CONSTRUCTION PHASE

- 1. Contractor completes project per time limit in contract
- 2. Deliver Certificate of Substantial completion to Board of Directors
- 3. Mail Notice of Completion to Property Owners
- 4. Pay final Payment of Retention to Contractor

ASSESSMENT BILLING AND COLLECTION A.R.S. 48-938 to 48-944

- 1. At least 30 days prior to any installment of principal or interest becomes due, the Superintendent of Streets shall give notice by mail to the owner of each parcel on which installment is due [A.R.S. § 48-938]
- 2. If not post marked by June 2 and December 2 a 5% penalty will be added to the installment due, unless those dates fall on a weekend, then will be added on that Tuesday
- 3. Within 20 days from the date of delinquency, the Superintendent of Streets shall prepare a list of assessment on which any installment is delinquent. [A.R.S. § 48-938]
- 4. Notice is sent to those property owners that unless each delinquent installment together with the penalty and costs thereon, is paid, the whole amount of the assessment will be declared due by him, and the property upon which the assessment is a lien will be SOLD at public auction [A.R.S. § 48-939(B)]
- 5. The Superintendent of Streets shall obtain a Title Search showing the names and addresses of record of all lien claimants on all lots or parcels in which installments are delinquent [A.R.S. § 48-940.01(A)]
- 6. At least 10 days before the date set for the sale, the notice shall be mailed to the owner of the lot or parcel on which an installment is delinquent.
- 7. The time of the sale shall not be less than 10 days after the completion of the mailing of the notices [A.R.S. §§ 48-939(C)]; 48-940.01(B)
- 8. At any time prior to sale, the delinquent installment plus interest may be paid [A.R.S. § 48-944]
- 9. A sale shall not proceed as to any property for which notice has not been mailed [A.R.S. § 48-940.01(C)]
- 10. A sale is conducted [A.R.S. § 48-941]
- 11. Certificate of Sale is to be issued to the purchaser or no purchaser, to the District [A.R.S. § 48-941]
- 12. Lien of the assessment shall only be removed by redemption [A.R.S. § 48-943]
 - a. Within 3 months of sale date - 5%
 - From 3 to 6 months of sale date - 10%
 - From 6 to 9 months of sale date - 12%
 - From 9 to 12 months of sale date - 15%
 - After 1 year - 20%
- 13. After the expiration of thirteen (13) months from date of sale the purchaser may apply Superintendent of Streets Deed if he has fully complied with the provisions of section 48-944 [A.R.S. § 48-944]

GENERAL DISTRICT OBLIGATIONS [A.R.S. §§48-952 - 48-955]

There are general obligations and operating expenses of the District, not paid for by assessments.

1. General Obligation of the District shall be provided for by the levy and collection of taxes upon the real and personal property of the District. [A.R.S. § 48-952 - 48-955]
2. Revenues of the District may be used to pay for certain improvements and obligations [A.R.S. § 48-964; see also A.R.S. § 48-961]
3. Other sources, includes grants or general funds of the District, may be used for general obligations [A.R.S. § 48-921]

OTHER PROVISIONS

There are numerous other provisions of the County Improvement District Statutes, which provide directions for formation and operation, which should be read, studied and utilized for effectively and properly providing essential, necessary and/or desired services and benefits.

Local Time:8:52:34 AM (Mon)

Elections - Special Districts

GENERAL OUTLINE FOR CREATING A STREET LIGHT IMPROVEMENT DISTRICT

I. Creating the District

A. Authorization: Arizona Revised Statutes, Title 48, Chapter 6, Article 1 sets forth the procedures for establishing a Light Improvement District. A.R.S. § 48-960 sets forth that an improvement district may be formed for the sole purpose of purchasing electricity for the lighting of the public streets and parks of the improvement district as follows.

B. Petition: A petition addressed to the Board of Supervisors requesting the establishment of a street light improvement district may be filed with the Clerk of the Board of Supervisors if signed by a **majority of persons owning real property or by the owners of fifty-one (51%) or more of the real property owners.**

The Petition shall set forth:

1. The name of the proposed improvement district
2. The necessity for the proposed district
3. That the public convenience, necessity or welfare will be promoted by the establishment of the district and that the property to be included in such district **WILL BE benefited**
4. The boundaries of the proposed district.
5. A general outline of the proposed improvement.
6. Such other matters as are required by this article.

C. Bond: A bond is set by the Clerk at the time of filing, to cover all expenses in the formation of the district. If the district is formed the expenses shall be paid by the district after a certified copy of costs is presented to the Board by the Clerk. If the district is not formed, the Board taxes costs against the signers of the Petition and collect costs on bond of Petitioners.

D. Verification: Each copy of the petition shall be verified by one of the petitioners and shall be accompanied by a plat or sketch indicating the approximate area and boundaries of the district.

E. Hearing Date: Upon receipt of the petition for the establishment of a Street Light Improvement District, the Board of Supervisors shall **set a date for a hearing not later than forty (40) days after presentation of the petition.** After setting a date for a hearing and not less than fourteen (14) days, prior to the hearing, the Board shall send by First Class Mail, to the home of each **absentee property owner**, (one who has resided outside the proposed district for more than six (6) months of the last preceding calendar year) within the proposed district, notification that a petition for the establishment of a Street Light Improvement District has been filed with the Clerk. The validity of the establishment of the district is not affected if any absentee owner does not receive notification before the hearing. To be eligible for such notification, the **absentee owner must give the Clerk a current address.**

F. Notice: The Board must publish the "**Notice of Hearing**" and statement of boundaries of the proposed district, **twice in a newspaper of general circulation in the county within which the proposed district is located**, one week apart and the **first publication shall not be less than ten days prior to the hearing.** The **notice shall also be mailed** by first class mail to owners of real property in the proposed district **at least twenty (20) days prior to the hearing.** The most recent property tax assessment roll shall be used for names and addresses. If the Board can prove that all real property owners, who did not sign the Petition received notice by registered mail or personal service ten (10) days before the hearing, it does not have to do the publication of "Notice of Hearing". Street Light Improvement Districts are formed the same way as other county improvement districts, as spelled out in A.R.S. § 48-902 and 903,; except that if the Petition presented is signed by all the property owners in the proposed district, the Board, after verifying that, may hold a hearing as set forth in A.R.S. § 48-906 without the publication required by A.R.S. § 48-905.

G. Hearing on Petition: At the hearing, the Board will decide if 1) the petition is signed by the requisite number of owners of real property in the proposed district, 2) if the establishment of the district is in the interest of public convenience, necessity or welfare, 3) determines the type of lighting to install, and 3) considers the rate to be paid for purchasing electricity for the proposed district. The Board may delete property described in the Petition if it decides it would not be benefited or add property the it feels would be benefited.

H. Provisions: Improvement districts for street or public park lighting formed under the provisions of A.R.S. § 48-960 and 961 shall be exempt from the provisions of § 48-912 through 917.

I. Board of Directors: established in this manner are governed by the Board of Supervisors sitting as the board of directors.

J. Recording of Order: Although the law does not require that the Order of Establishment of the district be recorded, in order to assure that this action becomes a part of the permanent record of the history of the district, and in order to assure that the impact of this action on taxes, assessments, voting, and the like is taken care of, it is critical that the instrument is recorded. Th Board will take responsibility for seeing that the instrument is recorded and will be responsible for sending a copy of the recorded instrument to the Department of Revenue, The United States Department of Justice, the County Assessor, Treasurer, and Elections Department.



Maricopa County

Office of The Superintendent of Streets

2901 W. Durango Street
Phoenix, Arizona 85009

****STEP 1: THIS COVERS THE INITIAL CONSTRUCTION COSTS****

AN INFORMATION SHEET ABOUT IMPROVEMENT DISTRICTS

What Is An Improvement District?

An improvement district is designed to provide neighbors a method of accomplishing local improvements and distributing the cost among all property owners who benefit.

How Do I Go About Getting One Organized?

To initiate an improvement district, a request for a petition must be submitted, in writing, to the Office of the Superintendent of Streets, outlining the extent of the improvements desired, (e.g., street paving, water or sewer lines, street lights, etc.). A petition, which includes the district boundary and a cost estimate, will then be returned to obtain signatures of either a majority of persons owning real property within the district or the owners of fifty-one percent (51%) or more of the real property within the district.

Upon receipt of a petition with sufficient signatures, the Superintendent of Streets will proceed with formation of the district. Proceedings and hearings as required by state law will be conducted with the Maricopa County Board of Supervisors serving as the Board of Directors of the district. This process, from start to finish, takes a minimum of eighteen (18) months to complete, depending on design and construction time requirements.

How Do I Pay For The Improvements?

The total cost of the improvement is either financed by special assessment bonds purchased through public bid or collected annually on the tax roll (for street lights and road maintenance).

Once the improvements are complete, an assessment is placed on every lot and/or parcel within the district. For districts financed with bonds, the assessment may be paid for:

- a) In cash, during the time provided, normally 30 days, or
- b) By semiannual installments of principal and interest (May and November), for a period not to exceed 20 years. The current interest rate on bonds is eight percent (8%).

If, after an assessment has gone to bond and an early payoff is desired, the payoff will include the unpaid principal balance *PLUS* interest to the next payment period *PLUS* a five percent (5%) penalty on the unpaid balance (premium to bond holder).

What If I Can't Make The Payments?

If an assessment becomes delinquent, the district is obligated to sell the property covered by that assessment to pay the special assessment bonds. The buyer is required to hold the lien for a minimum of one year before applying for a Superintendent of Streets deed to the property. During that period, the - assessment lien must be paid in full, plus penalties. Once a deed is issued, the buyer has control of its redemption value.

For districts on the tax roll, it is considered the same as delinquent taxes.

Who Can I Talk To For More Information?

For further information on improvement districts within unincorporated areas of Maricopa County, contact the Office of the Superintendent of Streets at (602) 506-8798.



Maricopa County

Office of The Superintendent of Streets

2901 W. Durango Street
Phoenix, Arizona 85009

****STEP 2: THIS COVERS THE OPERATION AND MAINTENANCE COSTS**** **AN INFORMATION SHEET ABOUT STREETLIGHT IMPROVEMENT DISTRICTS**

What Is A Street Lighting Improvement District?

A street lighting improvement district (SLID) is a mechanism for residents to incorporate street lights into their neighborhood. The SLID provides the ability for the lighting of public streets and parks and assesses the cost of operation and maintenance among all property owners within the district.

Note: A SLID cannot be used for lighting of private subdivisions. Typically, the operation and maintenance of streetlights in a private development become the responsibility of the Home Owners Association.

How Do I Go About Getting One Organized?

To initiate an improvement district, a written request for a petition must be submitted to the Office of the Superintendent of Streets, outlining the extent of the improvements desired, along with a legal description and map. A petition, which includes the district, will then be returned to obtain signatures of either a majority of persons owning real property within the district or the owners of fifty-one percent (51%) or more of the real property within the district.

Upon receipt of a petition with sufficient signatures, the Superintendent of Streets will proceed with setting the hearing to organize the district before the Maricopa County Board of Supervisors. If signatures representing one-hundred percent (100%) of the real property within the district are received, the formal notice of a public hearing is not required and the hearing can proceed at the first available Board meeting. Proceedings and hearings as required by state law will be conducted with the Board of Supervisors serving as the Board of Directors of the district. This process, from start to finish, takes a minimum of three (3) months to complete, depending on design and construction time requirements.

How Are The Property Owners Assessed For Operation And Maintenance?

For new developments, the construction cost is borne by the developer and the operation and maintenance costs are paid for through the SLID. Per statute, the properties are assessed based on assessed value, unless the petitioners specifically request costs to be assessed per square footage of property. (This method must be approved by Board of Directors). SLID costs are collected annually as part of the property tax bill, under the Special District Detail section.

Who Can I Talk To For More Information?

For further information on improvement districts within unincorporated areas of Maricopa County, contact the Office of the Superintendent of Streets at (602) 506-8798.

MOHAVE COUNTY PUBLIC WORKS

THE IMPROVEMENT DISTRICT PROCESS

This is an outline of the procedure involved in gaining improvements through Improvement Districts. Purposes for which Improvement Districts may be used: Arizona State Statutes 48-909, www.azleg.gov/ars/48/00909.doc

FORMATION OF AN IMPROVEMENT DISTRICT

1. Inform Public Works of your desire to form an Improvement District by contacting:
Zelda Wright, Improvement District Supervisor
3675 E. Andy Devine Ave., Kingman, AZ 86401
(928) 757-0914
zelda.wright@co.mohave.az.us

Have the following information to start the process:

- A. What are the boundaries of the district? Street name or physical boundaries of a given area (Subdivision, Township, Range and Section)
 - B. Who will be a contact person for the district?
2. County personnel will prepare a petition packet which will contain the following information:
 - A. Necessary county assessor's maps and vicinity maps
 - B. List of all property owners in the proposed district with address labels
 - C. Petition to the Board of Supervisors in legal format.
 3. Contact person will be notified when packet is ready.
 4. Property Owners will circulate the petition and return them to the above address. The petition must be signed by owners of **51% of the real property or 51% of the owners of the real property affected by the district.**
 5. A \$5.00 Bond per parcel must be returned with the petition or \$500 total. This bond will help defray the expense of obtaining the assessors maps, list of property owners and address labels along with mailing and publishing notices for public hearings that will be held to gather public input for the proposed district.
 6. When the 51% of the real property is reached, a date will be set for the petition to be presented to the Board of Supervisors. At this meeting the Board will accept and form the district or reject the petitions.
 7. After receipt of the petition and the bond, the Board of Supervisors must set a date for the hearing on the petition. The date shall not occur later than 40 days after the presentation of the petition.
 8. Notice announcing the hearing and stating the boundaries of the proposed district shall be published twice in a newspaper of general circulation in the County within which the proposed district is located. Notice of the hearing on the petition must be mailed, at least twenty days before the hearing, to each property owner in the proposed area that appears on the most recent assessment roll for State and Local Taxes.
 9. At the hearing, supervisors will consider all objections and, if appropriate, establish the boundaries and declare the Improvement District organized as a political subdivision of the State of Arizona with specific boundaries for the purposes of carrying out the provisions of the improvement district statutes.

MOHAVE COUNTY PUBLIC WORKS

THE IMPROVEMENT DISTRICT PROCESS

PETITION TO INCUR EXPENSE

When a specific project is requested, such as paving, a Petition to Incur Expense is assembled stating an estimated cost calculated by the engineer.

1. This petition is circulated by the property owners until **51% of the owners of a majority of the frontage of the property deriving a benefit** have signed their approval committing the district to the expenditure of funds.
2. If the petition is approved by the property owners in the district, the engineer will then be directed to prepare final plans and specifications and advertise for bids on the proposed work.
3. Bids will be opened and awarded to the contractor with the lowest acceptable bid at a Board of Supervisors meeting.
4. The property owners will then be notified by mail (Cash Demand) the exact cost for their portion of the project. They will have approximately 30 days to pay all or part of their cost to avoid paying any interest. What monies are not collected from the property owners during these 30 days will be bonded. Bonds are awarded to the Bond Company with the lowest interest rate. The interest rate has varied from 9.3% in 1990 to 6.3% in 2003.
5. The property owners that did not pay all of their costs, during the Cash Demand period, will have their portion included in the bonding process which places a lien on their property equal to taxes and previous special assessments. The bonds are for 10 years and paid semi-annually. Payments do not start until at least 6 monthsst after construction is completed and they are due June 1st for 1/2 of the interest due for one year and December 1st for the other 1/2 of the interest due plus the principal for that year. NOTE: Once we have gone to bond, those property owners that are included in the bond assessment will be responsible for the full 10 years of interest even if they are paid off early.
6. When we have the cash from the property owners and the bond company, construction will begin.

NOTE: If only one specific project is needed in a district a **Petition to Form & Incur** can be circulated as one petition, however, they have to meet the requirements and steps of both the above petitions. The district then will become an Improvement District for that one specific purpose and no other.

ITEM 7

(handouts at meeting)



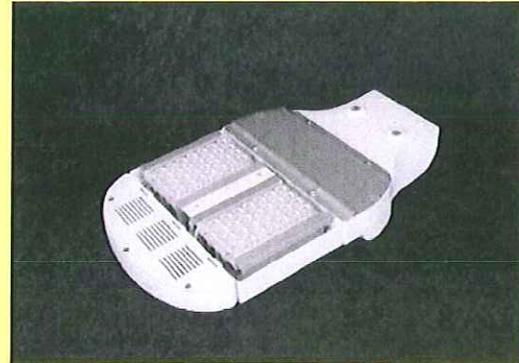
SEESMART™

Seesmart™ LED
 4139 Guardian Street
 Simi Valley, CA 93063
 Tel: 877.578.2536
 Fax: 888.239.0959
 Web: seesmartled.com

Mission: Imagine, Engineer and Produce LED lighting products that work with the Environment, not against it.

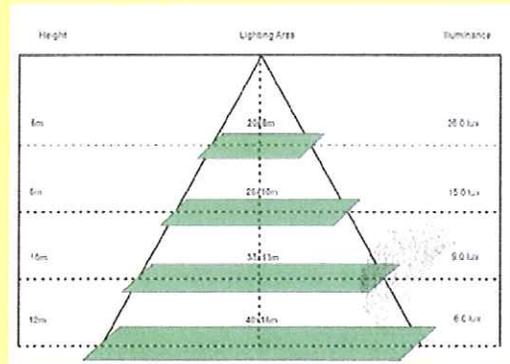
LED Cobra Head Street Light 75W

Wattage: 75W
 Lumens: 4,200lm
 Color Temperature: Day White (5800k)
 WarmWhite (2700k)
 Natural White (4100k)
 CRI: 75
 Dimensions: 540mm(L) x 315mm(W)
 x 90mm(H)
 Lighting Angle: 120°
 Life Hours: 50,000+ hrs
 Housing Temperature: Less than 95°F
 Ambient Temperature: -22-122°F
 Replaces: 150W or 250W HPS Cobra Head Street Light
 Working Voltage: AC 120V-277V / 24VDC
 Net Weight: 7kgs



Illumination (E)

(Height=6m) ≥26 Lux (Replaced sodium light of 65 lux)
 (Height=8m) ≥15Lux (Replaced sodium light of 38 lux)
 (Height=10m) ≥9 Lux (Replaced sodium light of 20 lux)
 (Height=12m) ≥6 Lux (Replaced sodium light of 15 lux)

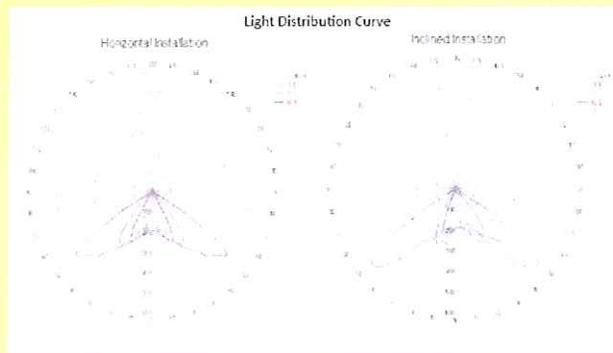


Features:

No UV, patented heat sink and optical diffuser, longer life than incandescent & fluorescents, wide voltage and constant current design, solid state, high shock & vibration resistant, mercury-free, 50%+ savings in energy consumption, no noise, no flickering. The products are in accordance with ETL and UL testing standards.

SKU #:

Day White: 190000
 Warm White: 190001
 Natural White: 190002



LED Cobra Head Street Light 75W

Due to advancements in LED technology, these specifications are subject to change without notice.

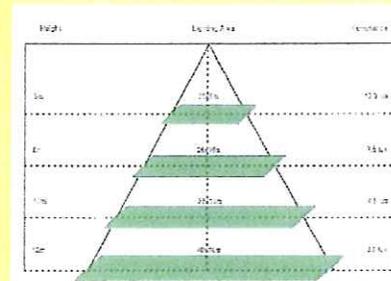
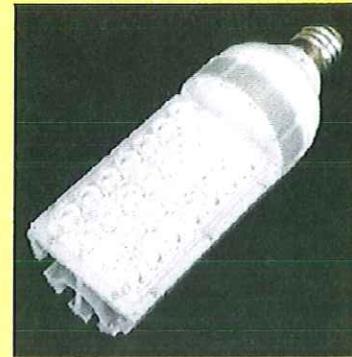


Seesmart™ LED
 4139 Guardian Street
 Simi Valley, CA 93063
 Tel: 877.578.2536
 Fax: 888.239.0959
 Web: seesmartled.com

Mission: Imagine, Engineer and Produce LED lighting products that work with the Environment, not against it.

E40 Retrofit High Power LED Street Light

Wattage: 36W
 Lumens: 2,100lm
 (8x brighter than Incandescent)
 Color Temperature: Warm White (2,700K-3,200K)
 Natural White (4,000K-4,500K)
 Day White (5,500K-6,000K)
 CRI: >75
 Luminous Efficiency: ≥80 lm/W
 Initial Flux/Output: 2500lm / 2100lm
 LED Count: 28 High Power LEDs
 Life Hours: 50,000+ hrs
 Lamp's Efficiency: > 90%
 Base: E40 Mogul Base
 Housing Temperature: Less than 95°F
 Ambient Temperature: -40-113°F
 Working Voltage: AC 120V-277V
 Input Frequency: 47Hz - 63Hz
 Replaces: HPS or Metal Halide



Illumination:

(Height=6m) ≥13 lux (Equal to HPS @ 33 lux)
 (Height=8m) ≥7.5 lux (Equal to HPS @ 19 lux)
 (Height=10m) ≥4.5 lux (Equal to HPS @ 11 lux)
 (Height=12m) ≥3 lux (Equal to HPS @ 7.5 lux)

Features:

Patented heat sink and optical diffuser, 28 LEDs, no UV. Has longer life than incandescent, HPS or metal halide. Wide voltage and constant current design, solid state, high shock & vibration resistance. Mercury-free, 50%+ savings in energy consumption, no noise, no flickering. The products are in accordance with ETL and UL testing standards.



SKU #:

Warm White: 190003
 Day White: 190004
 Natural White: 190005

E40 Retrofit High Power LED Street Light

Due to advancements in LED technology, these specifications are subject to change without notice.

