NAME

Flooding with Public Works Director Michael Webb

DATE

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DURATION

39m 45s

4 SPEAKERS

Katie
Steve
Michael Webb, Director of Public Works
Kristen Reagan, Civil Engineer

START OF TRANSCRIPT

[00:00:06] Katie
I'm Katie.

[00:00:07] Steve
And I'm Steve, and this is the City of Redding podcast.

[00:00:10] Katie
Today we're diving into a critical topic how Redding storm drain infrastructure is designed to manage heavy rainfall and how the city works to prevent and respond to flooding.

[00:00:19] Steve
We're joined by Director of Public Works Michael Webb and City Engineer Kristen Regan to discuss Redding stormwater management efforts. They'll break down how the city's storm drain system is designed, where the water flows, and the preventative maintenance strategies in place to keep our drains clear and functional.

[00:00:33] Katie
We'll also explore ways the community can help, from keeping leaves and debris out of the drains to reporting flood prone areas. Michael and Kristen will give us insight into what caused the recent flooding and how the city coordinates with the Bureau of Reclamation during heavy rainfall or dam releases. And finally, we'll get a look into future improvements and how the city responds when emergencies arise.

[00:00:53] Michael Webb, Director of Public Works
Hi, this is Michael Webb. I am the Director of Public Works here at the city of Redding, and with me here today, I have a special guest. One of our associate engineers, Kristen Regan.

[00:01:03] Kristen Reagan, Civil Engineer
Hi, I'm Kristen Regan, and I work for the city of almost six years. I am an associate civil engineer with the design team in Public Works.

[00:01:11] Steve
Perfect. Well, thank you, Michael and Kristen for joining us today. We're happy to have you. And given the recent storms and rainfall and even flooding that Redding has experienced with the water releases and things of that nature, we thought it was important to get you guys both on the podcast to talk a little bit about some of the infrastructure here in Redding and how things work, and why they work the way they do, and if and when things don't work, what happens in that instance? So maybe we can just start with some general questions as far as with the storm drain systems here in Redding, how are they designed to manage such heavy rainfall again like we experienced in the past few weeks? Yeah.

[00:01:41] Michael Webb, Director of Public Works
Great question Steve. Thank you. Essentially it's very complicated. And so Kristen and I are going to touch on a few things here today to try and give everyone a peek behind the curtain. But essentially what happens is our storm drain system is designed to handle different intensities of storms based on the size of the project. And so, as you can imagine, there are a number of projects going on around town. Right. We see subdivisions being built. We see commercial projects such as the Costco project, and we even see our own projects such as, you know, bridge replacements or, you know, streets or adding of sidewalks. And each of those projects, we have to look at the appropriate design storm and then make sure that the drainage infrastructure, you know, the curb and gutter, the drainage inlet, the pipe that connects to the inlet, the pipe that connects to that pipe that connects to that pipe that touches the channel, that touches another pipe that ultimately finds its way to the Sacramento River, that all that infrastructure, really, from where the water is collected to where it outfalls, is properly sized to handle the the proper storm. And that's where I say it gets a little bit complicated and why I brought my heavy hitter today, Kristen, to kind of help me with that, because it gets very complicated, because the design storm will change depending on the type or the size of the project. And so I brought Kristen here to to help me with that a little bit today. And she'll kind of walk us through the the different intensities or storms that we design for. And when basically.

[00:03:26] Kristen Reagan, Civil Engineer
Most of what you're going to see in our subdivisions is infrastructure that's designed for a ten year storm event, and a ten year storm event is the 1 in 10 chance of any given year the storm is going to happen, so that would be 10% chance.

[00:03:39] Katie
Was the storm that we just had considered a ten year storm event?

[00:03:43] Kristen Reagan, Civil Engineer
Essentially, we did see periods of rainfall that was in excess of a ten year storm event overall. Generally, if you add all the rainfall that we did receive. It was just shy of a ten year event, but the cloudburst we saw was anywhere between 1015 years. We even saw a short period of a 25 year storm event. But looking at that, realizing all of these different storm events, our system handled it pretty well. We had a few instances where we did lose. I use that term very loosely. Pipe down at the boat ramp at the Sacramento River, and then we had some minor damage to a private property when the street became overwhelmed with water, which is actually pretty good, in my opinion, that our streets and our pipes and our inlets did their job, as did our storm drain crews for keeping them clean with all the releases from the dam. And there's just all these moving parts that made it, you know, one great storm. But we did a really good job. Our our infrastructure handled it very well.

[00:04:48] Katie
And prior to a storm like this, does the city do any extra work to prepare? Like, do storm drain crews make another round of storm drains, or are street sweepers going again to try to clear these out prior to a storm that you know is coming?

[00:05:04] Michael Webb, Director of Public Works
We do. Right. As Kristen mentioned, we have a crew that's running around and their main focus is on our storm drain infrastructure. So we have a vac con truck where we can go in and kind of essentially clean out our culverts and make sure that they're not clogged. And we work with our with Shasta County, with Caltrans and all of our neighbors to make sure that that everyone's infrastructure is free of, you know, stuff inside of it or debris. We check a number of the hot spots around town to make sure that that infrastructure is ready to go. Of course, you two probably know, and many of our listeners, that we provide free sand and sandbags at a number of locations around town where community members can go pick that up and use them accordingly. But I do want to take that opportunity to kind of just share. Most people probably don't realize the city maintains over 200 miles of. Culverts, and we have an additional 200 miles of open channels or ditches, roughly about 6800 drainage inlets. So when I mentioned just a few moments ago that our crews are running around and maintaining things, we have a crew of roughly 5 or 6 staff dedicated to that, but they've got over 400 miles of infrastructure that they're responsible for. So there's a lot going on and really proud of the crews. Like Kristen mentioned, for the really the amount of rain that we we received a couple of weeks ago over that one week period and how our infrastructure held up. I think all things being equal, we did pretty darn well.

[00:06:39] Steve
It's definitely a testament to the crew. A job well done. I'm curious talking about the ten year storm event standards, is that industry standard when cities are going through, you know, expansion or subdivisions or general growth, or is it specific to an area like Redding, where adjacent to a river maybe sees more rainfall than some of these more arid or desert climates? How does that ten year storm event standard get set, and why is that the one that the city Redding follows?

[00:07:03] Michael Webb, Director of Public Works
Yeah. Good question Steve. And I'll take the first stab at it and then let Kristen jump in. Essentially, depending on the size of the project, that is what governs the design storm that is used. So a smaller project would likely use a ten year storm, with the larger projects going up to a 25 and even a 50 year storm. And really, it depends on the size. And so we're talking about do we have a over a 100 acre subdivision or do we have a 50 acre subdivision, or do we have a ten acre subdivision or project? And really, the larger the project gets, the larger storm That project is required to analyze and then size the infrastructure or drainage infrastructure more appropriately. For.

[00:07:53] Kristen Reagan, Civil Engineer
Just to give you guys an idea, ten year storm equates to 40 acre basin area. So anything that's 40 acres or less is going to be designed to handle a ten year storm. Anything in excess of the 40 acres goes up to the 25 year. And then if you have a really, really big area where the 100 year, it's got to be an area over 160 acres. So that's kind of the breakdown between the three storms that we're looking at. Got it.

[00:08:20] Steve
And when we say ten year storm, are those being gauged strictly by water accumulation or is it the intensity of the rainfall, I guess. How does ten year storm or any of these 25 or 50. How do these storms get measured? Is it strictly how much water is accruing?

[00:08:33] Michael Webb, Director of Public Works
It's all statistics, Steve. Essentially what a ten year storm means is and I think Kristen mentioned this earlier, is that there is a 1 in 10 or 10% chance that we will see that amount of rainfall in any given year. Right. So every day throughout the year, there's a 10% chance that we're going to see the ten year storm. And it could be for ten minutes, 15 minutes or or an hour. Right. And so it becomes very statistical in nature. So then the the you know, the 20 year storm has a 5% chance of occurring in in any given year. A 25 year storm has a 4% chance of 50 year. Storm has a 2% and a 100 year event. A 1%. And so, as you can imagine, that that makes sense, right? Because, you know, the odds of getting the the belly whopper, the just the the raining cats and dogs for hours and hours and hours, those go down. Right. And I think everyone kind of intuitively knows that. But it's always good to kind of jump back to the numbers.

[00:09:48] Katie
And I mean, you're talking about current construction and new construction and new builds. I'm sure there are parts of Redding that have aging infrastructure. Was this always the norm, the ten year storm, or are there are parts and places in Redding that you know were built prior to these standards and might have a harder time dealing with that amount of water?

[00:10:08] Michael Webb, Director of Public Works
So Katie, I was hoping you would ask a question similar to this because you're spot on, I would say, without having to dig back up and look through all the standards. Probably the early 80s is when the industry standard was essentially set for certain intensities or storms being used based on the size of your project or the size of your your drainage basin. Um, I would say stuff prior to that was done differently. Um, obviously I wasn't here or working in a capacity is an engineer at that time. But I can tell you that we have a number of areas in town that are older than that, and a number of parts of town that were actually county that were annexed by the city. And you've probably heard folks talk about the enterprise annexation of 1976, right. Where, um, at the enterprise area, which was formerly not the city of Redding, was annexed in and and the city inherited a lot of not all of that infrastructure. Right. And so we do spend a lot of our time out maintaining, working with property owners in those areas because we do get a lot of questions regarding, hey, why do I get ponding or flooding? Or why doesn't this work? Why do why does this part of town have curb and gutter and drainage inlets and maybe other parts do not? Um, or why is one culvert considerably older than the other? So we do see that a lot.

[00:11:43] Steve
Touched earlier Michael, on the way the water flows from the storm drains through various pipes, eventually making its way down to the Sacramento River. I'm trying to envision that. Am I correct to think that the further away you are that you live from the Sacramento River, the more your water goes down your storm drains in your neighborhood. It has to flow to get to the river. So as a result of that, when you're identifying maintenance areas or general inspection areas, are you starting closest to the river and working your way out to the outlying areas, knowing that if you have a failure or a leak or something close to the river, that is potentially more problematic because all that water from all those outlying neighborhoods are funneling to those pipes or that pipe. I guess I'm just trying to understand how the actual flow of that stormwater works on its way to the river.

[00:12:21] Michael Webb, Director of Public Works
Um, good question Steve. Essentially, we look at the whole network from project to outfall, I guess would be the way I would describe it. And I wouldn't say there's any more significant weight given to a pipe that's at the end of the system as opposed to a pipe in the beginning. Our projects that we designed in house, we analyze the whole the whole path that oftentimes includes and as I described earlier, probably what we would describe as overland flow, where you have water, kind of, you know, over your front lawn or your driveway, you might call it sheet flow, and then it collects somewhere like maybe in a, in a gutter. Right. And then you get more channelized flow to a drainage inlet and then into a series of pipes that may or may not contain channels and then jump back into a pipe. And so really each project has to evaluate that whole entire network, both pre their project and then after their project. And then if there's a a difference, if there's an increase in flows Then the project needs to mitigate that, and that can be done multiple ways. We can hold water back. So typically referred to as detention. Right. And a lot of times folks around town probably see like the Coles or other commercial developments around town. They build these very large pipe networks under the parking lots. Essentially what that is doing is that is detaining a whole bunch of water, and then it will release it once the system downstream can handle it. And so that kind of a long winded answer to, to your question there. So I apologize for that. In a way.

[00:14:11] Steve
It's not all that different than vehicles merging onto the highway when they have those metering lights on. Right. So that not all the vehicles are getting out at the same time, they're kind of strategically placing those vehicles into the flow of traffic to prevent backups.

[00:14:21] Michael Webb, Director of Public Works
Yeah. No, that it's very similar. And it sounds like you could come help us down in engineering. Steve.

[00:14:26] Steve
Perfect. Send me a.

[00:14:28] Katie
I had a question about residential neighborhoods. I live in an older neighborhood that has a lot of mature trees and I found all winter. I mean, these trees are dropping leaves and stuff all the time in the street. I see that there are sandbags next to the storm drains that are in my neighborhood, and I'm wondering, is that the city of Redding that places those are those residents that place those. What's a resident's responsibility for the storm drain when it comes to trees and leaves and that kind of a thing? And what does the city of Redding do to help manage areas of the city that have just a ton of leaves that fall?

[00:15:03] Michael Webb, Director of Public Works
So great question, Katie. If the inlet, the drainage inlet is owned and operated and maintained by the city, then then we the city are responsible for that. And it's very, very likely that it is our staff running around and sandbagging those ditches or drainage inlets to keep the leaves and other debris out. Because what happens is, as you, you know, as leaves get in there and clog up the grates or clog up the curb. Opening water can't get in. So then it jets by that inlet and it will go down to the next one. And what happens is we start seeing downstream impacts. Right. Because water was not able to get into the pipe network at the spot that it was designed to. And so those sandbags are really meant to hold that debris back. So water can still get in as well as not let the debris get in and clog up, you know, the network of pipes underground. And so that's something that our folks are doing pretty routinely. Now. There are a number of instances where we have, I guess, what I would describe as a combined storm drain system, where there's a city owned, operated pipe that then may drain into a privately owned channel or ditch, and then that channel or ditch may jump back into a city maintained drainage inlet and culvert.

[00:16:30] Michael Webb, Director of Public Works
And in those situations, and this is one of the questions that Kristen and I get pretty frequently in the winter time is who's responsible for maintaining those, those private ditches or channels or even culverts in some case. And I think many property owners become surprised when they realize that it's not the city, it's them. Right. And so we spend a lot of time working with those property owners and their neighbors to kind of educate them on, you know, that they have a part in this as well, too. If there's private drainage infrastructure that that they need to keep it, you know, clean and functional and remove the vegetation from it as it grows and, and keep other debris out of it. Because if one chain in the in the link has issues, then the whole system won't function right. And it's going to take everyone to, to keep their systems functioning properly for the whole system to work.

[00:17:27] Steve
What about in instances where you touched earlier on the annexation of enterprise? I know there's areas specific to roads. I'm assuming the same holds true for underground storm drains, but where? Maybe you're driving on a city of Redding Road, and then that same road switches to a Shasta County road or Caltrans right of way, for example, and then back to the city of Redding. I'm assuming that those pipes follow those same routes. Is there an agreement between agencies like the county, like Caltrans and the city to repair, or is it depending on where those pipes fall within that boundary, that agency's responsible?

[00:17:54] Michael Webb, Director of Public Works
Yeah, absolutely, Steve. So there are a number of instances where, you know, a city has infrastructure that goes under state right away, right. Either highway 44 299, I-5 273. And so we have agreements with them for us to maintain our infrastructure essentially on their property. We have other times where our infrastructure works together, where then we have maintenance agreements and roles and responsibilities, like who's on the hook for what if it breaks, who's responsible for maintenance. So there are a number of different types of agreements depending on the arrangement. But you're spot on, right? Those the neighbors, if you will, the the state and the city or state, county and city. We'll have to work together at the end of the day because water doesn't care whose property it's on. It just needs to get from point A to point B, right. So we're we're facilitating that as best as possible.

[00:18:49] Steve
As a result of that, there are instances where if you're replacing aging infrastructure and maybe the city wants to go ahead and replace that, but maybe the, you know, again, the county or Caltrans feels differently that that doesn't yet need to be replaced. How are those conversations held or how are those decisions made where it's multiple agencies pipeline, if you will, that everyone has to agree on the same thing, or it's these industry standards that when it gets to a certain amount of degradation or an age of the pipe, it's getting replaced regardless. So a good.

[00:19:15] Michael Webb, Director of Public Works
Question. Again, generally the county, the state and the city are in very much the same boat, which is We really don't have adequate dedicated resources to maintain what we have. And as I mentioned earlier, we've got roughly 200 miles of culverts and another 200 miles of ditches and channels, and we have around a half $1 million per year dedicated for, you know, replacing aged and failed infrastructure in the county, in the state, I would guess, are in a similar boat. And so generally, we don't find ourselves too much disagreement over what needs to be replaced. Right. The math is the math. And we've got, you know, a bunch of smart people on everybody's team. What oftentimes ends up being the conversation is, where do you put the new infrastructure and what are the impacts of it? Right. Because you can imagine if a hypothetical situation, let's say we had a 24 inch diameter pipe going underneath highway 44. Well, there's a lot of things under highway 44. There's a bunch of buried utilities. There's other storm drain infrastructure. Right. So it's it's not like we can just put anything under there we want. Well, if we do the math and we determine that we need to make that culvert bigger, maybe go from a two foot diameter to a five foot diameter culvert. Right. It can't necessarily go in the same location now. It's got to be deeper. Typically we like to have certain covers. So the amount of material above the top of the culvert to the bottom of the pavement. So those are the things that typically we we have a lot of back and forth on is figuring out where's the best place to put the new color and have the least impact to everything else that's already there, so that it will function properly? That's really the the big game. Okay.

[00:21:08] Katie
Jumping back to residents and kind of community responsibility for some of these things, you said that the city maintains the storm drains, but is there anything you would ask of community or residents in taking any kind of ownership over the storm drains that are on their streets. I mean, I see a lot of leaves and other things that are in the street. Should residents take an active role in trying to keep that stuff out of the storm drains? I know we do stuff on litter going into the storm drains. Like, what would you ask of city residents when it comes to storm drains and their maintaining them?

[00:21:41] Michael Webb, Director of Public Works
Yeah. Thank you Katie. I would ask the community to not think of our storm drain system as like, maybe per se, a garbage disposal at home. Right. We don't want folks intentionally putting leaves or yard waste down there. Right. That's why we have the green cards, you know, through our solid waste department. Obviously, we don't want to put chemicals down there, right? That all goes to Sacramento River. And and we want that water to to be clean and good and, and all those things. And you know, another thing I would ask is and this is never a bad thing if if somebody sees something that seems out of the ordinary, it's it's never bad to pick up the phone or to go to the city's website and, and send in a, hey, I saw this, right? Because a lot of times the community can be our some of our best eyes and ears, because our 5 or 6 folks dedicated storm drain can't be everywhere at once. And so if something is seen out of the ordinary like, hey, there's a great missing, or hey, this, this drain is completely plugged and it's overflowing, right? There's water going over the sidewalk. And I mean, those are good phone calls for us to get because we would rather know before something bad happens so we can get out there and take a look. Some other things that kind of come to mind. Katie Redding has some pretty flat portions of town where, you know, a few minor little things can can make a difference between water potentially ponding in someone's front yard or on their driveway, or from water continuing to flow in the gutter and down to the drainage inlet.

[00:23:22] Michael Webb, Director of Public Works
And I say that because, again, there are a number of flat spots in town where, you know, maybe garbage day was two days ago and folks haven't grabbed their their trash carts and moved them out of the gutter pan. Something as simple as trash cans in the gutter can hinder and build little miniature dams for that water, and it will allow water to pool up and back up and create ponding. And I understand not everybody may have the ability to to move their carts immediately or or have a dedicated spot for them, but if they can, that'd be something. I think that could be good as well as even there might be times where if you have somewhere to park your vehicle other in the street along the curb, right. There could be times during heavy storms where even the wheels of your vehicle could create a little bit of an issue. And again, those flatter parts of town. So I would just ask that their folks are thinking about that and doing anything that they can. But then also reaching out to us if they see something that's out of the ordinary. Jumping back to the.

[00:24:25] Steve
Flooding that we saw recently, a large portion of that was with the release of waters from the dam, maybe in conjunction with the heavy rainfall that we've been talking about. But talk us through that a little bit, truly. What factors led to that flooding? I know when folks drove around town, you know, Park Marina was closed. If you drove over the Sacramento River on highway 44, you saw how high the river was. Is that an anomaly or is that something that residents should be expecting and why? Why did that happen? And what does it mean for our areas?

[00:24:48] Michael Webb, Director of Public Works
Yeah, I'd be happy to do that. And I'm going to take a little bit of Christine's kudos here, because she put a pretty good summary of that event for me together. And I'm going to kind of hit the highlights of it. But essentially, in my opinion, what we saw kind of there, I guess late January through the 4th or 5th of February was we saw a little bit over about ten inches of rain. And what that means is we had about 5 or 6 days with a pretty constant amount of rainfall down here in the valley. And I say down in the valley, because again, intuitively, we all know if it's generally rain and decent here, if you look to the west or north or east, it's probably raining more up in the mountains. And so what that means is, as it's raining here, it's still raining up in the mountains, all that water has got to go somewhere. Right? So we're we're this the soil down here in the valley is, is seeing rain. It's becoming saturated, which means. Right. It's it's kind of hitting its peak point to where it can't absorb anymore at its typical absorption rate. But at the same time, we're seeing all the tributaries, the small little creeks, the small ditches and channels that don't typically flow water.

[00:26:01] Michael Webb, Director of Public Works
They're starting to have water in them. We're starting to see Shasta Lake, right, the water surface elevation raise, and we're starting to see the bureau, you know, look at where we are in the year, what the weather forecasts are for the rest of the year, and determine that they may want to release some water so that they have adequate capacity for the remainder of the weather, or, excuse me, the winter system. So what we kind of see, in my opinion, is almost like a perfect storm environment to where we have saturated soil, to where you really can't get the ground to absorb much more water. And we see a lot of local ponding, you know, in folks yards and flat areas. We see all the tributaries run in full because it's been raining up in the mountains, and we see the river through Shasta Dam and Keswick Dam pretty high, because they're having to release water to make sure that they have adequate storage for future events. And then when you combine that with, as Kristen mentioned earlier, we really saw over that 5 or 6 day period of that storm from late January to early February, we saw. I believe it was 117 or 18 hour period, and it was the Saturday night through Sunday morning.

[00:27:19] Michael Webb, Director of Public Works
We saw pretty heavy rain, and we kind of teetered on around a 25 year event, which again, that's that 4% chance of seeing that in any given year. And that's really when we started seeing a few spots around town start to have issues. Right. Because we were having all those things occur. And so I think I've mentioned it a few times and Kristen did as well. I think all things being equal, the city's infrastructure is done pretty darn well, given that we kind of saw that perfect storm environment. And then of course, Steve, like you mentioned, along the Sacramento River, right. We're seeing the level of the river raise considerably associated with the releases. Right. And we're well aware of of what flows typically trigger Park Marina, the portion specifically under Cypress Street Bridge to require closing for public safety. Right. Because the river overtops that portion of Park Marina and it's roughly in the 40 to 43,000 cubic feet per second releases. And I know I kind of said that very quickly, but that's a lot of water. I mean, we're 40,000 cubic feet every second. That's how much water is going down the river at that point where we start seeing impacts to Park Marina. And I do want to stress, we saw releases from Keswick up in the low 60s.

[00:28:52] Michael Webb, Director of Public Works
So we were seeing 150% of that. And that's why, you know, folks, they're driving around town going over the river. And you're wondering, man, I haven't seen the river this full in a long time. Well, generally we don't see this every year, right? It really kind of is that that perfect storm that that triggers the bureau to release that amount of water. Interesting fact in the Redding area, the the rivers really sized for around 80,000 cubic feet per second before we start seeing impacts to businesses that front the river. And so I don't know about you guys, but there's a number of times where my family and I will be out on the weekend River trail or somewhere, and my kids will ask, dad, why is that house that's so close to the river, built 200 yards away from the river? Well, it's built 200 yards away from the river because there's that once every 10 or 15 years where the river is right next to that house. Right. And we have floodplains for a reason. And we make sure that structures are not built in an area where you know the river is going to come down or drain it. You know, they'll be flooded out.

[00:30:13] Katie
I'm making an assumption. You can correct me if I'm wrong here, but I have to assume that because Shasta Lake was full last year, it's probably why we were seeing some impacts this year. You know, in years prior, Shasta Lake was so low it could absorb a lot of that water before actually having to do releases. But with last year being full and then this year having another good water year, is this like a cycle that happens in Redding, where every 5 to 6 years or so, you see kind of this like water, these few water years in a row where Shasta Lake is full, can't really take any more water. So you have to have those high releases just to manage the rest of the year. I mean, in a drought year, I feel like we don't experience these issues.

[00:30:55] Michael Webb, Director of Public Works
Yeah, that's a really good question, Katie. And so I'm going to put a little caveat to my response. I don't work for the bureau. And so I'm just speculating here. Right. This is not I'm not I'm not quoting them. I believe what they're trying to do is they're trying to end the winter with the full reservoir across the state. Right. And if you step back and think about that, what that really means is that someone is sitting back and they're looking at how much water is in the lake. What time of the year is it? What's the forecast for the remainder of winter, and how do I ensure that I'm as close to peak capacity come middle of June as possible? Right. And so what that's going to mean is, is if I'm that person, you know, I'm watching the weather like a hawk. I'm, I'm, I have rain or flow gauges at all the tributaries that drain into Shasta Lake. And I'm monitoring how much water is coming in, and I'm only letting out the bare minimum to make sure I have enough capacity for the remainder of winter. And I think what'll we'll see is, as the Bureau right is, is shooting for that target of entering spring and summer with full reservoirs. We may see these larger releases at certain times, because they don't want to let that water go earlier in the year to to not capture it later.

[00:32:26] Michael Webb, Director of Public Works
Right. And so it's it really is a crystal ball, right. You're, you're, you're you're watching the weather. You know, these are very smart people and they're using the data that they have. But at the end of the day, you you really are mitigating it. And then I think to your other point historically, right. There are patterns and weather. Right. It seems like historically we might experience 3 or 4 years of wet weather right where we had pretty good average rainfall years. And then we might experience a couple two that are below average. Right. And the whole idea of, you know, a Central Valley water project and this cool infrastructure we have around us is to kind of minimize the impacts of those heavy years where we get a lot of rainfall to minimize flooding impacts, but then also make it so when we experience the droughts, they're not as dramatic, right? Because we've been able to store and then have that water. And then the secondary benefit, which might even be the primary benefit at this point now, is right. We generate electricity right at all of these facilities. So they're kind of a win win win. But it's it takes a lot to, you know, accurately predict the amount of weather that we're going to have and the remainder of the year with a goal of trying to start the spring or summer with full reservoirs.

[00:33:57] Steve
I'm wondering too. Then at the city level, we talk a lot about water conservation, especially in the summertime, right? I know we've had restrictions in the past, and I know there's new legislation coming down that may change that even further. Are there any plans? I'm assuming it's cost prohibitive. Are there any plans the city has on infrastructure to improve stormwater retention as far as collecting that rainwater, collecting that stormwater to use elsewhere? That's something that's being done in other places. Is there any technology that is available to allow cities and jurisdictions to do anything like that, or is it essentially at this point, like I said, cost prohibitive? It's too expensive to try to do those things to make it worthwhile.

[00:34:32] Michael Webb, Director of Public Works
Or are you asking, Steve, if if we're looking into capturing stormwater and then treating it and potentially turning that, you know, back into something that's usable either for, for humans or, or else.

[00:34:45] Steve
That question comes up all the time, especially in the warmer months where it's everyone's on these water restrictions and trying to conserve, conserve, conserve. And you see these months like we're having now where water is just dumping by by the truckload. Are there any things available, I guess, or any technology or any infrastructure improvements? Yes. Where we as a city can capture this water, treat it if needed and use it elsewhere.

[00:35:05] Michael Webb, Director of Public Works
So we're not looking into that currently right now as a city, but some businesses and others have reclaimed water or other things right where they're they're collecting it on their own and they're using it for irrigation purposes. There are a number of cities in throughout the country that are kind of going full circle. If you will bear with me, this might be a little bit of a squirrel, but a long time ago, your storm drain system and your sewer system were generally combined. And there was a big change a number of years ago prior to my time to where they were ultimately separated and storm drain, you know, so essentially rainfall did not need to be collected and treated before discharged back to the. The river. We're kind of seeing a little bit of a pivot, or at least. Folks are starting to ask the question with all of the ms4 and all of. The treatment stuff that is now required of of cities. We're wondering, or at least having the conversation about, does it make sense to start combining the two again? So in other words, instead of collecting the stormwater and then conveying it to the river and discharging it, there's a conversation occurring at a much higher level politically about should we capture that stormwater and send it to the wastewater treatment plant and treat it and then discharge it to the river? I we're very early in having those conversations, and it's really happening at the state and federal levels. But I would imagine for us the cost to switch over or transition to that as well as the impact would be pretty significant. Right. And it would be essentially impossible to do that all at once, and it would be a phased approach if and when it ever, you know, came to fruition.

[00:37:09] Katie
Well, I think it's a worthwhile conversation to have. I mean, given all the conversations statewide about water resources and saving water, I mean, I think we're really lucky to be in this area that we have Shasta Dam and Shasta Lake and the healthy groundwater supply. But we know statewide that that's not the case. So people are having those conversations about saving water. I'm wondering if you get questions or concerns from the community that are really just misconceptions that you can dispel here. Like, what do people think about the storm drain system that you would clear up here on this podcast?

[00:37:43] Michael Webb, Director of Public Works
Well, that's a good question. I would think one of the bigger things that comes up is in our parts of town that were previously annexed, where subdivisions were developed, and maybe a subdivision does not have curb, gutter and sidewalk, but it has a paved street. We tend to get a lot of questions about why is the city not coming out and installing curb, gutter and sidewalk and drainage infrastructure? Or why does the city maintain the curb and gutter? The subdivision over. But but not, you know, here. That really boils down to when those certain areas of town were annexed from, you know, as part of the enterprise annexation or from other parts of the county. What that means is it was accepted in its current condition by the city, but but only certain aspects. So we may have only accepted the the pavement, the street, and we may not have accepted the frontage which which means that if I owned a home in that subdivision, at some point, if I build curb, gutter and sidewalk in front of my house, then the city would accept it and be on the hook for owning and operating and maintaining it. But until that point, it's on the property owner, because that was the arrangement prior to it being annexed and included in the city.

[00:39:10] Steve
Yeah, that makes sense. Are there any other comments that you want to leave the community with on this topic?

[00:39:15] Michael Webb, Director of Public Works
Just a big thank you to the community. I appreciate all the the comments we get. Again, them being a big part of our eyes and ears. I really appreciate the questions and the open mindedness we can get through all this stuff. We're working together.

END OF TRANSCRIPT