100 Years

CAWD Connections

CONSUMER NEWS FROM YOUR CARMEL AREA WASTEWATER DISTRICT SPRING/SUMMER 2015

CARMEL AREA WASTEWATER DISTRICT • SINCE 1908 •

"Protecting your health and the environment"

Capital Improvement update

Bids for upgrade are all in!

After three years of intensive effort by our staff and Board of Directors, we are happy to report that the bidding process for Phase One of CAWD's 15-Year Capital Improvement Projects 15-Year Master Plan is now complete. We have received seven highly competitive estimates and will award the contract to the best candidate on April 30, with construction slated for July.

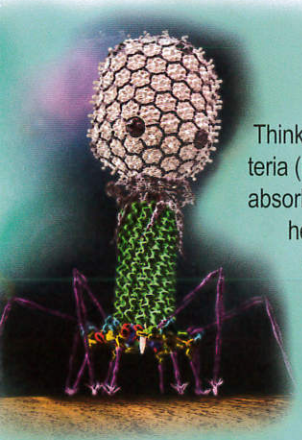
"We carefully analyzed the marketplace to time our posting for the best response," said CAWD General Manager Barbara Buikema. "We also made many phone calls to get the word out. The construction market is starting to heat up in the Bay Area, but we believe we are on the front end of the wave and the very competitive bids we received bear this out." In addition, CAWD's finely tuned plans for all capital projects will ensure budget accuracy and accountability throughout the construction process.

Another major step in the plant upgrade was completed in March when our new super-efficient dual gas/methane heat exchanger and boiler went online in our digester building. Our digester transforms the sludge from incoming wastewater into a dense biosolid, producing methane as a by-product. Our microturbines burn the methane to generate electricity to help run the plant. The exhaust from the turbines enters our new heat exchanger which is so efficient it can fully heat our digester in a circular, self-perpetuating system, thereby saving energy costs and preventing the release of methane (a greenhouse gas) into the environment. Previously we had to pay for gas during cold weather because our turbines couldn't keep up. The new boiler will be used as a backup heater when the turbines are being serviced, and also runs on 100 percent digester gas—just one more way we are getting the most out of every ratepayer dollar.

A+ FOR EFFICIENCY
CAWD's new heat exchanger (at left) and boiler (right) allows us to use 100 percent of the plant's by-product methane for power and heat, saving thousands of dollars in gas bills annually and preventing the release of greenhouse gas into the environment. Shown here are CAWD Principal Engineer Drew Lander (left) and Maintenance Supervisor Ralph Stevens.

MICROORGANISM OF THE MONTH

MEET "BORIS" *BACTERIOPHAGE!*

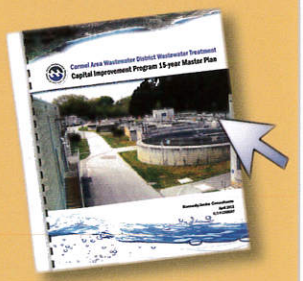


SINISTER OR ELEGANT?
Looking like an alien landing module, "Boris" bacteriophage has impressive biomachinery (shown color-coded in this electron microscope image) which hijacks bacteria and turns them into bacteriophage factories.
Purdue University and Seye LLC

Think it's bad when you catch a flu virus? Then pity your poor friend Escherichia coli bacteria (E. coli), who right now is nestled cozily in your intestines, helping you digest food and absorb vitamins. When he gets a virus the result is always the same: he dies long before he can run out to buy tissues. E. coli is a main player at the CAWD treatment plant. Our laboratory technicians are always measuring him to monitor the effectiveness of our disinfection system.

Wherever you find E. coli you'll find his nemesis, "Boris" bacteriophage. There are countless types of phages, and each attacks only the one strain of bacteria it's evolved to infect. While bacteria are the most abundant life form on our planet, the phages are the most numerous biological entity in existence (since they are dormant particles until they encounter E. coli, phages don't fit the normal definition of life).

Boris looks somewhat like an alien landing module. He has six spidery tendrils or "legs" that sense E. coli and bind to the bacteria's cell wall. This triggers a series of complex actions: Boris deploys six spikes at his base, which stabilize his sheath so it can contract, injecting DNA into E. coli like a microscopic hypodermic needle. The viral DNA hijacks E. coli's biomachinery, *(Cont. on page 2)*



View our plant upgrade master plan online

Click on the financial tab at CAWD.org to find our Capital Improvement Projects 15-year Master Plan.

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Flush with confidence . . .

Your CAWD team provides the expertise needed in engineering, chemistry, biology, microbiology, public policy and management to safely clean our community's wastewater.

Our mission: to protect human health, wildlife, and the environment, including the Carmel River lagoon/wetlands, and Carmel Bay, a designated Area of Special Biological Significance.

Our **Board of Directors** are elected officials who represent the public interest and ensure transparency. The **General Manager** oversees fiscal responsibility and administration. Our **Principal Engineer** designs projects and creates new systems to ensure efficiency and effectiveness. The **Plant Superintendent** supervises operations, creates budgets, and plans for future needs. **Certified Operators** monitor instrumentation and automated technology. Our **Maintenance Supervisor** repairs machinery and prevents breakdowns. **Collection Workers** inspect, clean and repair sewer lines to prevent spills and protect the environment. **Lab Analysts** test waste stream samples and effluent throughout the treatment process.

Carmel Area Wastewater District

3945 Rio Road Carmel, CA 93923
(831) 624-1248 ■ CAWD.org

Free 24-hour sewer back-up service: Call 624-1248, or 624-6403 after-hours. *If water is backing up in your tub or toilet it is an emergency. Call us immediately day or night.*

CAWD is a special district dedicated to protecting public health and the environment with the cost-effective collection and treatment of wastewater and the return of clean water to the environment.

We welcome the public to attend CAWD board meetings, held the fourth Thursday of each month at 9 am at the CAWD office.

Board of Directors

Suzanne Cole
Greg D'Ambrosio
Robert Siegfried
Charlotte Townsend
Ken White

General Manager, Barbara Buikema

"Bug of the Month" © Anne Muraski 2001-2014

We hate to brag, but . . .

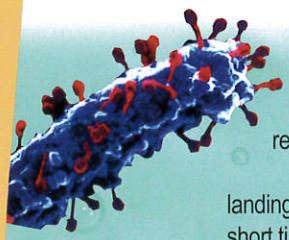
CAWD Collections is honored again!

We thought you'd like to know that once again your Carmel Area Wastewater District has been honored to receive the Collection System of the Year award. This is the second year in a row CAWD has received the prestigious award, which was presented by Simon Watson, President of the California Water Environment Association. CAWD was chosen as the best in the Monterey Bay Section, which includes a large geographic area encompassing Santa Cruz, Morgan Hill, all of Monterey Bay, King City and Hollister.

Winners are nominated and chosen by their own peers, based on safety and maintenance records, on-site inspections, regulatory compliance, best management practices, and other parameters. Employee qualifications are also important, and that's another area where CAWD shines. Our five-member maintenance crew all have high grade levels and certifications.

"All our guys are totally dedicated to achieving excellence," said Collections Superintendent Daryl Lauer. "Our goal is always to provide the highest standard of service. We're on top of new developments in the industry and we're always hungry and eager to learn more."

TWICE HONORED! Simon Watson, President of the California Water Environment Association (far left) was on hand to honor CAWD collections crew members, which include Collections Superintendent Daryl Lauer (holding award) and inspectors (from right) Barry Blevins, Andrew Millington, Robert Bowman, and Mark Napier.



An E. coli bacterium is attacked by numerous phages seeking to replicate themselves. Some E. coli strains undergo a programmed "suicide" to prevent the spread of the virus to other bacteria.

Microorganism *(From front page)*

turning it into a phage factory. Within 15-25 minutes the overcrowded bacterium bursts, releasing 50-100 phages to prey on other nearby E. coli.

On a human scale, Boris has to be the scariest sci-fi villain ever. Imagine if a mosquito-size landing pod alighted on your shoulder and injected you with genetic material that made you explode a short time later, releasing more modules to take out the rest of the neighborhood! In fact, in any given 48-hour period, about half the number of all existing bacteria everywhere is destroyed by phages, in all environments: deep in the soil, in the oceans, in plants, animals and humans, and at the CAWD treatment plant. If bacteria didn't multiply so quickly we'd all be in trouble—we can't live without it!

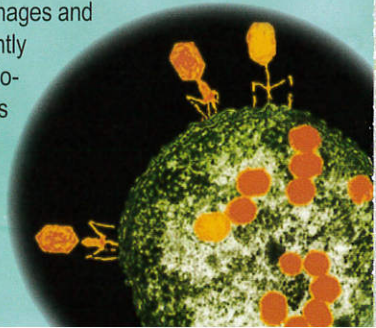
Yet E. coli is not completely defenseless. There are some strains that undergo a programmed cell death before the virus can finish the job. Instead of clinging to life until the end, they perform a kind of altruistic "suicide" to prevent the spread of the virus to other cells.

We're all in this together

Despite its seeming ruthlessness, it's hard not to admire the elegant biomachinery of the bacteriophage. Scientists have been intrigued with it for decades, and, as our overuse of antibiotics creates more superbugs, they are seeking ways to harness phages to target and kill resistant bacteria, as well as cancer cells. There is already an approved bacteriophage drug for ear infections, and phages are also used in cheese and meat as an antibacterial agent to combat food-borne illnesses.

It can be pretty brutal in the microworld, whether it's in our CAWD treatment tanks or anywhere else on the planet. Bacteria mutate to resist being killed by phages and pharmaceuticals while at the same time phages and human drugs constantly evolve to overcome the mutated bacteria. Although the methods of bacteriophages may make us shudder, they really are no different than we humans who are doing the same thing to them: commandeering their biomachinery to do our own bidding. And so it goes. As humans, the microworld lives in, on, and around us, and we evolve with it, side by side. *For an amazing video showing Boris in action, please visit tinyurl.com/phage8.*

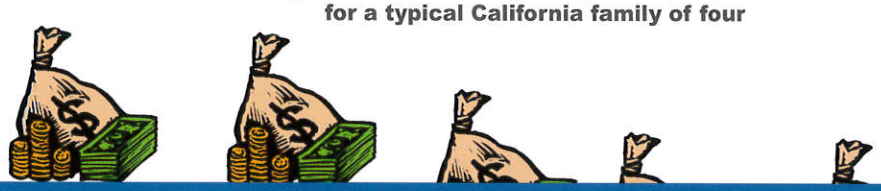
At 64,000 times magnification, you can plainly see the phage fibers or "legs" attached to the surface of this single E. coli.



CAWD sewer fees—

How do we stack up to other utilities?

Approximate monthly utility cost comparison for a typical California family of four



gas/electricity	cell phone	cable	water	CAWD proposed sewer fee
$187	$180	$104	$52	$47.95

New camera system pinpoints blockages

As part of our mission to provide the most efficient and effective services possible, the CAWD Board of Directors recently authorized the purchase of a new closed circuit television truck and remote inspection system. The new truck replaces our 20-year-old truck which we purchased used eight years ago. Along with our line cleaning truck, this new equipment provides the primary tools required to keep our community's sewer lines in good condition.

CAWD operators drive the system's remote controlled camera through the sewer lines to locate breaks, root intrusions, and blockages. Inside the vehicle, certified CAWD operators analyze the live feed on computer monitors, recording photo and video data to help us prioritize the maintenance and capital projects needed to prevent sewage spills and protect our environment. If there's a problem, the unit can send out a signal so a construction crew can pinpoint the exact location and depth of the pipeline.

The new camera has many improvements to save money and time, including an auto-fed, retracting reel, and independent wheel controls that prevent entrapment. The remote also has a heavier, state-of-the-art design to withstand slime, grit, and even underwater submersion with fewer breakdowns and less maintenance. Two different sized trackers accommodate a variety of pipe widths, and allow operators to follow a grease trail right to a lateral line to locate the source—often a faulty grease trap. The new system will help CAWD meet state regulations which require a visual inspection of all 84 miles of our main line a minimum of every five years.

Inside CAWD's new television truck, Operator Barry Blevins receives live video feed of his fellow crew members who are outside preparing to deploy our remote controlled camera. Also shown on one of the system's three screens is an image of a root-clogged pipe captured during a previous inspection.

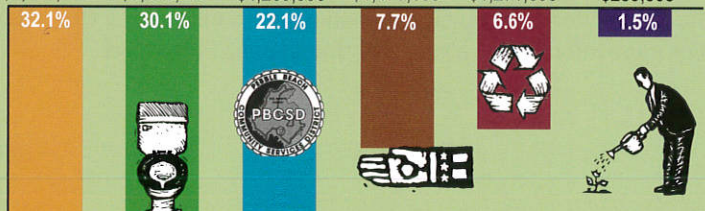
Carmel Area Wastewater District Proposed Budget

July 1, 2015-June 30, 2016

Sources of Cash

$19,288,858

Capital Reserve Fund	Sewer User Fees	PBCSD* Fees	Property Taxes	Reclamation Project	Interest Income/Other
$6,190,809	$5,800,715	$4,260,506	$1,479,635	$1,271,630	$285,563
32.1%	30.1%	22.1%	7.7%	6.6%	1.5%



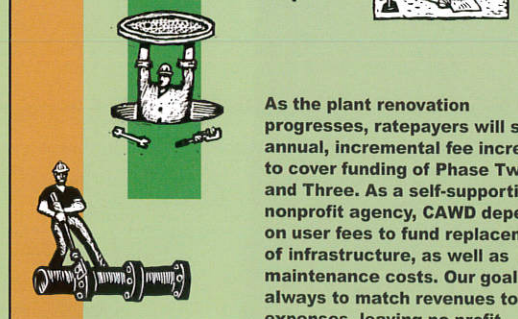
After nearly three years of planning, design, and evaluation, CAWD will begin construction of our $40 million Capital Improvements Projects 15-Year Master Plan in July. We will fund Phase One with Capital Reserves totaling approximately $15 million. The remaining $25 million in projects must be covered by user fees and the Pebble Beach Community Services District, which is paying one-third cost as per our agreement to provide them with wastewater treatment.

* Pebble Beach Community Services District

Uses of Cash

$19,288,858

Capital Projects	Operations & Maintenance	Reclamation Project	Debt Service
$11,905,860	$6,620,555	$546,880	$215,563
61.7%	34.3%	2.8%	1.1%



As the plant renovation progresses, ratepayers will see annual, incremental fee increases to cover funding of Phase Two and Three. As a self-supporting, nonprofit agency, CAWD depends on user fees to fund replacement of infrastructure, as well as maintenance costs. Our goal is always to match revenues to expenses, leaving no profit.

Proposed lagoon barrier impacts CAWD

Many of you may not know about the Ecosystem Protective Barrier Project (EPB) that Monterey County has proposed for construction at the Carmel River Lagoon. The barrier would be a sheet pile flood wall built on State Park land along the northern perimeter of the lagoon. CAWD is a nonprofit, special district charged with protecting human health and the environment. The responsibility of CAWD and its elected Board of Directors is to inform you, our ratepayers, about the impact the proposed barrier would have on CAWD operations.

1. The EPB would allow the lagoon water level to rise higher than currently allowed, putting our operations at risk. CAWD owns eight acres of land between the lagoon and the CAWD treatment plant, purchased with public funds to be a buffer that protects water quality, the environment and public health. The EPB would create a "bathtub effect" that would render nearly seven of our eight-acre buffer useless as a safeguard containment area. Encroaching lagoon water could attract protected species, which could also prevent CAWD from using public land for the public purposes it was intended.

The proposed Ecosystem Protective Barrier Project includes a five to six-foot tall flood wall that would run along the northern perimeter of the Carmel River Lagoon (shown here).

2. Historically, flooding from the river has occurred—briefly and naturally—approximately every 20 years, and plant infrastructure was built to withstand this temporary immersion. However, the plant was not designed against water encroaching from the lagoon and is not equipped to operate in standing water. Many of CAWD's buildings and equipment are subterranean. They are not waterproof and will flood.

3. The EPB also threatens CAWD's Reclamation Facility, which transforms incoming wastewater into pristine irrigation water—up to 1.5 million gallons of water each day—which supplements the limited water supply from the overpumped Carmel River and the depleted Seaside basin. Through our public-private partnership, CAWD provides over 1,000 acre feet of recycled water to the golf courses in Del Monte Forest each year. Any disruption of this supply would have a severe impact on the local economy via jobs and revenues generated that benefit our entire community.

We have asked the County to include consideration of the potential impacts to CAWD in the environmental documents required for the Ecosystem Protective Barrier. We have stated that costs to mitigate the impacts to CAWD should be funded as part of the County project. Your CAWD Board of Directors believes that the costs should not be borne by CAWD's 16,000 ratepayers.

CAWD will continue to meet with all parties involved to find solutions. Our goal is to ensure that any project constructed to prevent flooding in areas to the north of the Carmel River Lagoon does not have the unintended consequence of flooding our community's vital wastewater treatment plant. For more information please visit tinyurl.com/EPBproject.

Did you know ...?

History of the CAWD plant and Carmel River Lagoon

Our community's wastewater treatment plant is located west of Highway One, adjacent to the Carmel River and nearly a half mile from the beach. The plant was built over 85 years ago to ensure that sewage never enters the ocean or the river, and it has protected our natural environment ever since. At the time, the Carmel River had a steady flow to the ocean most of the year and CAWD rarely flooded. Plant infrastructure was constructed to withstand infrequent flooding, which historically has occurred approximately every 20 years.

As demand for water increased, the river was overpumped, reducing flow and preventing water and fish from reaching the ocean. Without a steady flow, the ocean forms a large sandbar that blocks the mouth of the river. During the rainy season the enlarged lagoon threatens to flood nearby low-lying neighborhoods, and can even reach the plant despite our eight acres of buffer area between the lagoon and our fence line. The proposed Ecosystem Protective Barrier Project, a flood wall along the northern perimeter of the lagoon, would allow water levels to rise higher than currently allowed, putting the CAWD treatment plant at risk.

Your elected CAWD Board of Directors has asked that the costs to mitigate impacts to our community's treatment plant be funded as part of the barrier project, so that CAWD ratepayers do not have to bear the burden. CAWD also believes that it may be prudent to wait for completion of the Los Padres Dam removal and the Highway One Causeway construction (south of the river) so that any resulting changes to the watershed and river hydrology could be evaluated before a decision is made to spend money on altering the lagoon.

Carmel Area
Wastewater District
3945 Rio Road
Carmel, CA 93923
831 . 624 . 1248

— Sewer rate notice inside! —

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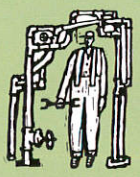

How does CAWD set sewer rates?

CAWD's rate model was devised by the State Water Resources Control Board. It allocates costs based on **flow, biochemical oxygen demand (BOD)** and **suspended solids**.

Flow is the amount of liquid wastewater—at CAWD this is about 1.4 million gallons each day. A large cost of flow is for the energy needed to continually pump the water to the headworks where it then gravity feeds through the rest of the plant during treatment.

Suspended Solids are the particles of matter left in wastewater after heavier solids have settled out. When wastewater enters the plant it is screened at the headworks to remove large debris—this goes to the landfill. Then the water goes to a clarifier where larger particles settle to the bottom. This sludge gets pumped to a digester that turns it into compost. The remaining particles in the water are the suspended solids that must be consumed by the billions of microorganisms we propagate to clean our wastewater.

Biochemical Oxygen Demand is the amount of oxygen consumed by the microorganisms that eat bacteria and clean our wastewater. The more concentrated the wastewater, the more oxygen we need to support the microbes. More oxygen means more cost to run the large blowers which aerate the water in our secondary treatment tanks, which are like giant aquariums of microscopic animals. Much of the plant's equipment and infrastructure are there to keep our hardworking "bugs" happy and healthy.

Carmel Area Wastewater District
3945 Rio Road
Carmel, CA 93923
(831) 624-1248 ■ CAWD.org

CAWD is a special district dedicated to protecting public health and the environment with the cost-effective collection and treatment of wastewater and the return of clean water to the environment.

Board of Directors
Suzanne Cole
Greg D'Ambrosio
Robert Siegfried
Charlotte Townsend
Ken White

General Manager
Barbara Buikema

— Proposition 218 Notification —
Notice of Public Hearing on Proposed Sewer Rate Increase

Thursday, June 25, 2015, 9:00 am
Carmel Area Wastewater District
3945 Rio Road, Carmel, CA 93923

On June 25, 2015, at 9:00 a.m., or as soon thereafter as the matter may be taken up, the Carmel Area Wastewater District (CAWD) Board of Directors will hold a public hearing prior to the adoption of its sewer rates. The hearing will be held at the District Offices located at 3945 Rio Road, Carmel, CA 93923.

The District remains fully committed and focused on the rehabilitation of our community's wastewater treatment plant—for full details please visit CAWD.org to see past newsletters and view our Capital Improvement Projects 15-Year Master Plan. After three years of ongoing effort we are awarding the contract for Phase One construction on April 30. We are able to provide this upgrade to our community's infrastructure thanks to rigorous longterm fiscal planning, extensive analysis and design, and—most importantly—the support of our customers.

As the saying goes, nothing lasts forever. Our treatment plant's last major overhaul was over 30 years ago, and we all understand that things wear out and need replacement. The plant also needs to keep up with new technology that saves energy and money, increases efficiency, and conforms to current standards for safety, best management, and environmental protection. At the same time, we are dedicated to getting the most out of every ratepayer dollar. For example, instead of replacing infrastructure, we are repurposing existing buildings and rehabilitating equipment whenever it is cost-effective.

GETTING THE MOST OUT OF EVERY DOLLAR
To avoid building a new and costly electrical room needed for our upgrade, we are instead repurposing employee office and locker room space to accommodate our expanding electrical system. Construction of our new employee building (shown here) will cost much less.

Our last major upgrade in the mid-1980s took advantage of Clean Water Act grant money, which greatly eased the burden on ratepayers. Unfortunately, grants for rehabilitation are nearly nonexistent these days, although we continue to aggressively pursue all opportunities. To fund the upgrade, your elected Board of Directors has chosen a pay-as-you-go method so that the District is not burdened with future debt. Instead, we will leave a legacy to ensure that future generations can operate the plant for the good of the community, and be well-positioned to meet any unforeseen challenges that might arise.

As a nonprofit special district, CAWD is dedicated to letting you know precisely where and how your money is being spent. Our goal is to match revenue and expenses, therefore we are not instituting a blanket, multi-year rate increase plan. Instead, each year we will mail out this notice to request only the additional fees required to complete the capital improvement plan as it evolves. This year, we are asking residential customers (our largest category) for an additional $5.09 per month to appear on property tax bills. That is the equivalent of an 11.89% increase—not insignificant by any means, but we believe an additional $61.08 per year is a good value to help ensure the long-term sustainability of the Carmel area wastewater system.

Our rehabilitation plans are ambitious, long range, and necessary. We've also started to plan Phase Two of the upgrade and are well into preparations of our 20-year plan for our collection system, including our 84 miles of main sewer line. As always, these projects

support our main mission to protect public health and the environment in the most cost-effective manner possible. We believe our beautiful community deserves a safe and reliable sewer treatment facility and we plan on being around to provide these vital services for many years to come.

The procedural requirements of Proposition 218 require that the District provide a notice of the proposed rate schedule to all property owners of record forty-five (45) days prior to holding a public hearing. In order for the increase to "not take effect," a majority of the property owners are required to file opposition to the increase.

Property owners may file a written and signed protest against the proposed increase with the Board of Directors of Carmel Area Wastewater District (CAWD) at or before the close of the public hearing. To be valid, a protest must be in writing even if you plan to attend the public hearing. E-mail protests cannot be formally considered. Each written protest must include the parcel owner's name, service address, assessor's parcel number for the parcel served, and the parcel owner's signature. Only one protest will be counted per parcel. If you own more than one parcel, you may file a single protest, but it must identify each parcel you own. The protest must be signed by the property owner(s). If the signer(s) is not shown on the last equalized assessment roll of Monterey County as the owner(s) of the property, the signer(s) must provide written evidence of ownership of said property. For your convenience we have included a protest form on our website, CAWD.org. At the hearing, the Board of Directors shall hear all protests and tabulate the ballots.

Protests should be mailed or delivered to the same address as the hearing location. For further detailed information regarding the proposed rate plan, please call James Grover, CAWD Principal Accountant, at (831) 624-1248.

Carmel Area Wastewater District
Proposed Sewer Rate Increases for 2015-2016

User Categories	2014-15 Annual Rates	2015-16 Proposed Rates	Percentage of Change
Bakery (each location)	$ 2,198.30	$ 2,369.08	7.77%
Bar (each location)	$ 864.82	$ 981.04	13.44%
Beauty Salon (each location)	$ 717.46	$ 819.78	14.26%
Business/Govt./Retail (1-10 employees = one unit)	$ 311.50	$ 355.02	13.97%
Camera/Photo (each location)	$ 456.96	$ 515.96	12.91%
Church/Synagogue/Mission (each location)	$ 478.50	$ 546.72	14.26%
Convalescent Hospital (per bed)	$ 260.20	$ 295.10	13.41%
Dental Office (per dentist)	$ 485.80	$ 561.02	15.48%
Gym/Health Spa (each location)	$ 612.82	$ 699.50	14.14%
Hotel/Motel (per room)	$ 260.68	$ 295.60	13.40%
Laundromat (per machine)	$ 587.30	$ 676.40	15.17%
Laundry (each location)	$ 2,262.74	$ 2,514.96	11.15%
Market (each location)	$ 1,053.90	$ 1,143.46	8.50%
Medical Office (per physician)	$ 247.18	$ 283.18	14.56%
Residential/Minimum vacant (each location)	$ 514.32	$ 575.46	11.89%
Restaurants (per seat/meal)	$ 43.36	$ 46.98	8.35%
School (per population)	$ 20.76	$ 23.88	15.03%
Service Station (per pump)	$ 1,619.06	$ 1,830.54	13.06%
Supermarket (each location)	$ 14,152.08	$ 15,350.08	8.47%
Special Users (each location)	$ 480.32	$ 548.60	14.22%
Veterinary Offices (each location)	$ 1,242.32	$ 1,406.20	13.19%
Vet Hospital/Boarding (each location)	$ 3,549.50	$ 4,017.72	13.19%