

Sustainability Roadmap 2018-2019: Green Operations

Progress Report and Plan for Meeting
the Governor's Sustainability Goals
for California State Agencies

California Department of Technology
Edmund G. Brown Jr., Governor

December 2017



California Department of Technology

Sustainability Roadmap: Green Operations

Ian Noumov

Alex Gomez

Glenn Franklin

Sarah Do

Authors

David Nahigian- Facility and Administrative Branch Chief

Mark Standley- Facility and Administrative Assistant Branch Chief

Directing Managers

Amy Tong

Director

TABLE OF CONTENTS

	Page
Table of Contents	i
List of Tables	ii
Acronyms.....	iii
EXECUTIVE SUMMARY	1
SUSTAINABILITY GOALS	2
Executive Order B-18-12	2
Executive Order B-16-12	2
Executive Order B-30-15	2
State Administrative Manual & Management Memos.....	3
GREEN OPERATIONS	4
Greenhouse Gas (GHG) Emissions	4
LEED for Existing Buildings Operations and Maintenance.....	1
Indoor Environmental Quality.....	1
Integrated Pest Management	3
Environmentally Preferable Purchasing	3
Location Efficiency.....	5
SUSTAINABILITY MILESTONES & TIMELINE	6
DEPARTMENT STAKEHOLDERS	7

LIST OF TABLES

	Page
Table 1: GHG Emissions since 2010 (metric tons).....	4
Table 3: LEED for Existing Buildings and Operations	1
Table 4: Pest control contracts	3
Table 5: State Agency Buy Recycled Campaign 2016 Performance	4
Table 8: Smart Location Score for new Leases	5
Table 9: Lowest Smart Location Score Leases.....	5

Acronyms

CALGREEN	California Green Building Code (Title 24, Part 11)
DGS	Department of General Services
EO	Executive Order
EPP	Environmentally Preferable Purchasing
GHGe	Greenhouse Gas Emissions
IEQ	Indoor Environmental Quality
LEED	Leadership in Energy and Environmental Design
MM	Management Memo
SAM	State Administrative Manual
SCM	State Contracting Manual

EXECUTIVE SUMMARY

The California Department of Technology (CDT) Gold Camp Data Center provides information technology services to many state, county, federal and local government entities throughout California. Through the use of a scalable, reliable and secure statewide network, combined with expertise in voice and data technologies, CDT delivers comprehensive, cost-effective computing, networking, electronic messaging, and training solutions to benefit the people of California.

CDT achieved the Governor's goal of reducing greenhouse gas (GHG) emissions by 20% through data center consolidation. Additionally, as discussed in previous Sustainability Roadmap reports, the department has identified several energy efficiency projects on their 5 year plan and has been proactive in improving overall energy efficiency. As of February 2015, CDT achieved LEED-EB (Leadership in Energy and Environmental Design for an Existing Building) Gold status for its Gold Camp Data Center in Rancho Cordova. This was accomplished with the combined effort of an energy consulting firm, the Department's building engineering contractor, and CDT's facility staff. In the process of obtaining LEED certification, an American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) level 2 energy audit was conducted on the Gold Camp data center. The audit revealed additional energy conservation measures which were implemented in the building.

CDT is aware of the significance of maintaining appropriate indoor environmental quality (IEQ) and ensures all alterations, modifications, maintenance repairs and cleaning procedures are made in accordance with the California Green Building Standards code. Additionally, CDT requests its contracted pest management vendor to follow an integrated pest management (IPM) strategy that focuses on long-term prevention of pest problems.

In similar respect, CDT emphasizes the importance of purchasing energy efficient and sustainable products to lower energy costs. CDT is committed to DGS's Environmentally Preferred Purchasing Program (EPP) and the Federal Energy Management Program (FEMP).

Incorporating sustainable practices within the Department of Technology saves money, which translates into lower rates for our customers and also benefits the environment. CDT seeks to lower State government's "ecological footprint" by actively advising other state departments on how to reduce the amount of energy used to power and cool IT equipment. While the Department has made great strides overall, it is critical to continue these efforts into the future.



Amy Tong
Director

SUSTAINABILITY GOALS

The Governor has directed California State Agencies to demonstrate sustainable operations and to lead the way by implementing sustainability policies set by the state. Sustainability includes the following general initiatives:

- Greenhouse Gas Emissions Reductions
- Building Energy Efficiency and Conservation
- Indoor Environmental Quality (IEQ)
- Water Efficiency and Conservation
- Monitoring Based Building Commissioning (MBCx)
- Environmentally Preferable Purchasing (EPP)
- Financing for Sustainability
- Zero Emission Vehicle (ZEV) Fleet Purchases
- Electric Vehicle Charging Infrastructure
- Monitoring and Executive Oversight

The Governor and legislature have directed state agencies to prioritize sustainable operations. The orders and legislation relevant to operations described in this roadmap are:

Executive Order B-18-12

EO B-18-12 and the companion *Green Building Action Plan* require state agencies to reduce the environmental impacts of state operations by reducing greenhouse gas emissions, managing energy and water use, improving indoor air quality, generating onsite renewable energy when feasible, implementing environmentally preferable purchasing, and developing the infrastructure for electric vehicle charging stations at state facilities. The Green Building Action Plan also established two oversight groups, the staff level Sustainability Working Group and the executive level Sustainability Task Force, to ensure these measures are met.

Executive Order B-16-12

EO B-16-12 directs state agencies to integrate zero emission vehicles (ZEVs) into the state vehicle fleet. It also directs state agencies to develop the infrastructure to support increased public and private sector use of ZEVs. Specifically, it directs state agencies replacing fleet vehicles to replace at least ten percent with ZEVs, and by 2020 to purchase at least 25% replacement fleet as ZEVs.

Executive Order B-30-15

EO B-30-15 declared climate change to be a threat to the well-being, public health, natural resources, economy, and environment of California. It established a new interim statewide greenhouse gas emission reduction target of 40 percent below 1990 levels by 2030, and reaffirms California's intent to reduce greenhouse gas emissions to 80 percent below 1990

levels by 2050. To support these goals, this order requires numerous state agencies to develop plans and programs to reduce emissions.

Assembly Bill 4

Assembly Bill (AB) 4, was passed in 1989. The State Agency Buy Recycled Campaign statutes are in Public Contract Code Section 12153-12217. The intent of SABRC is to stimulate markets for materials diverted by California local government and agencies. It requires state agencies to purchase enough recycled content products to meet annual targets, report on purchases of recycled and non-recycled products, and submit plans for meeting the annual goals for purchasing recycled content products.

SGC Resolution on Location Efficiency

Location efficiency refers to the greenhouse gas emissions arising from the transportation choices of employees and visitors to a building as determined by the Smart Location Calculator. Adopted on December 6, 2016 the resolution directs members of the Strategic Growth Council to achieve a 10% improvement in the Smart Location Score of new leases compared to the average score of leased facilities in 2016.

State Administrative Manual & Management Memos

The following Management Memos (MM) currently impose requirements for green operations on the department under the Governor's executive authority:

- MM 15-04: Energy Use Reduction for New, Existing, and Leased Buildings
- MM 15-06: Building and Grounds Maintenance and Operation
- MM 14-05: Indoor Environmental Quality: New, Renovated, And Existing Buildings
- MM 14-07: Standard Operating Procedures For Energy Management In State Buildings

GREEN OPERATIONS

Greenhouse Gas (GHG) Emissions

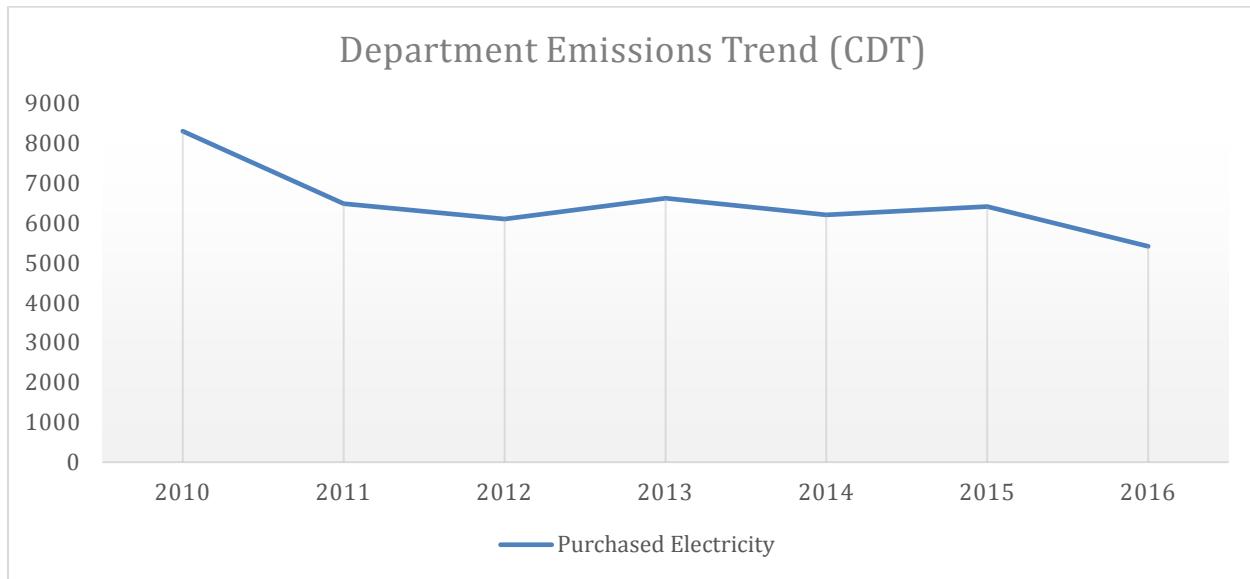
State agencies are directed take actions to reduce entity-wide greenhouse gas emissions by at least 10% by 2015 and 20% by 2020, as measured against a 2010 baseline.

- Energy Efficiency
The department met the GHG reduction goal primarily through the consolidation of two older, inefficient data centers into two energy efficient data centers (Gold Camp and Vacaville). Combined with the completion of energy efficient projects, described in previous Sustainability Reports, the department was able to significantly reduce the amount of GHG produced. CDT has identified several energy efficiency projects on their 5 year plan, such as replacing the cooling towers and rooftop air handlers, further reducing GHG emissions.
- On-Site Renewable Energy
CDT is currently close to entering the construction phase of a solar PPA project that will generate a maximum of 1 megawatt (MW) of electricity and 9.5% of its total electrical demand annually. The reduction in grid based power purchases will result in a continued reduction of GHG emissions beginning in 2018.
- Purchased Renewable Energy
CDT continues to work with SMUD to evaluate the potential for using Greenergy and solar share programs. CDT must pass on all increased facility costs to departmental customers.
- Diesel fuel is purchased to refill our generators for the data center in the event of a power outage. While, the State's renewable diesel was considered, after review, it was determined that it is not suitable quality for critical standby generators.
- In the future, we will review the possibility of using Greenergy and solar share programs to further reduce GHG emissions from electricity purchases and offset increased future demand.

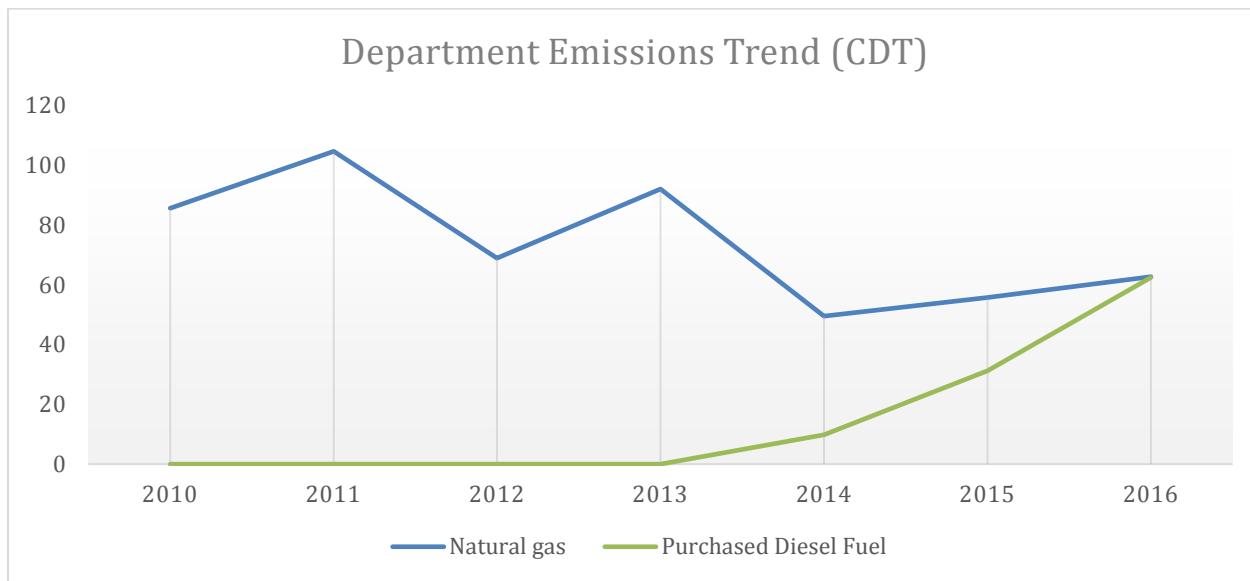
Table 1: GHG Emissions since 2010 (metric tons)

	2010	2011	2012	2013	2014	2015	2016	Percent Change since Baseline
Natural gas	85.7	104.74	69.02	92.13	49.56	55.75	62.73	-26.8
Vehicles	0	0	0	0	0	0	0	N/A
Purchased Electricity	8311.3	6488.82	6107.63	6631.4	6213.25	6416	5419.77	-34.8
Purchased Diesel Fuel	0	0	0	0	9.8	31.25	62.50	Not required in 2010
Total	8,397	6593.56	6176.65	6723.53	6272.61	6,503	5,545	-33.97

Graph 1: GHG Emissions- purchased electricity since 2010 (metric tons)



Graph 1a: GHG Emissions- natural/diesel fuel since 2010 (metric tons)



LEED for Existing Buildings Operations and Maintenance

All State buildings over 50,000 square feet were required to complete LEED-EBOM certification by December 31, 2015 and meet an Energy Star rating of 75 to the maximum extent cost effective.

The Department achieved LEED Gold- EBOM certification for its only Department owned 154,250 Gold Camp facility in February 2015. The facility was awarded LEED-Gold status for achieving a total of 65 points. CDT contracted with an energy consulting firm, Envision Realty Services, to carry out processes and procedures to achieve LEED Gold. Using a combination of onsite contracted engineers and state staff, CDT accumulated the necessary documentation to put the LEED program in motion and follow through with achieving accreditation.

Additionally, the Gold Camp campus achieved an Energy Star rating of 95 out of a maximum of 100 and completed an ASHRAE level 2 audit. Although not unprecedented, obtaining an energy star score and conducting an ASHRAE level 2 audit on a facility with a high percentage of process energy dedicated to data processing introduced a unique set of challenges; however, state and contracted staff were able to overcome the challenges through effective teamwork and communication. Various loads were tested in the building including the IT equipment, lighting, and HVAC system. Through the energy audit and a HVAC analysis, various energy conservation measures were identified, such as demand control ventilation, heating lockout, supply air resets for the air handling unit, chiller sequencing, and water savings in the restrooms. Energy conservation measures for the building were simulated to analyze the overall effect on both energy usage and comfort condition. In the office space, indoor air quality performance testing was also performed and CO₂ monitoring was added for increased savings and employee comfort.

Table 3: LEED for Existing Buildings and Operations

Number of Buildings over 50,000 sqft and eligible for LEED EBOM	Number of Building over 50,000 sqft that have achieved LEED EBOM	Percentage of buildings over 50,000 sqft required to achieve LEED EBOM that have achieved it
1	1	100%

Indoor Environmental Quality

When accomplishing Alterations, Modifications, and Maintenance Repairs and when relevant and feasible, state agencies shall implement the mandatory and voluntary measures of the California Green Building Standards Code (CALGreen), Part 11, related to indoor environmental quality.

Indoor Environmental Quality must also be maintained through the use of low emitting furnishings, cleaning products and cleaning procedures.

New Construction and Renovation

CDT is compliant and remains proactive in ensuring voluntary CALGreen measures related to IEQ are implemented in all building projects. CDT's Facilities and Procurement unit references a CALGreen checklist on all building materials before moving forward with a purchase.

While there are currently no plans for new construction or renovations, the Department will ensure that any new projects are implemented using CALGreen measures and will work with any contractors accordingly to ensure the standards are being met. This includes any renovation projects including air systems and daylighting.

CDT is compliant and remains proactive in ensuring all furniture and seating purchased complies with all mandated specifications and requirements. CDT's Facilities and Procurement units purchase seating furniture from CALPIA and routinely reference the DGS Purchasing Standard when procuring new furniture. CDT actively participates in environmentally preferred purchasing.

Cleaning Products

DGS custodial staff comply and only use cleaning products that meet the Green Seal (GS) Standard GS-37. Facilities staff regularly verifies compliance. The lead janitorial staff meets with Facilities on a weekly basis to confirm compliance. This is done by checking inventory of cleaners on-site. We use both concentrated and ready-to-use cleaning products, concentrated products are diluted at designated chemical dilution stations. DGS Building Manager, Cadie Marrotta, implemented a green product program at GC Facility in 2014 that the Facility has continued to use with no pushback from staff.

Cleaning Procedures

DGS custodial staff comply and adhere to the following building cleaning standards:

- All vacuum cleaners used in department facilities achieve the Carpet and Rug Institute Seal of Approval. Facility staff review all requests for new vacuum cleaners from janitorial staff and verifies that they are certified. Printed copies of the appropriate sections of CA Code of Regulations have been placed in the janitor's closets for reference to TITLE 8 cleaning procedures.
- Entryways are maintained as specified in the CalGreen Section A5.504.5.1
- Green Seal GS-42 cleaning procedure standard
- Carpet and Rug Institute's *Carpet Maintenance Guidelines for Commercial Applications*
- Title 8 Section 3362 cleaning procedures
- Janitor's closet is located in close proximity to Facilities Suite. When products come in, we make sure to check against invoices to verify that products are "green".

HVAC Operation

- Gold Camp Data Center's onsite building engineers ensure that the HVAC systems provide the required minimum outdoor air requirements.
- The building engineers are in compliance relating to annual HVAC inspections and are documented in writing. The inspection includes:
 - Verification of minimum outdoor airflows using Building Management System (BMS) airflow measuring instruments.
 - Confirmation that air filters are clean and replaced based on manufacturer's specified interval.
 - Air filters used have a MERV rating of no less than 11.
 - Verification that all outdoor dampers, actuators and linkages operate properly.
 - Checking condition of all accessible heat exchanger surfaces for fouling and microbial growth, with action taken when fouling is found at the cooling towers.
 - Checking the first 20 feet of ductwork downstream of cooling coils for microbial growth, take action if growth is found.

- Gold Camp's HVAC system is a closed loop system and a closed loop VAV system does not require downstream microbial testing. Therefore this item is N/A.
- Ensuring that cooling towers are properly maintained and that records of chemical treatment are kept. Retrofit to prevent cooling tower plumes closer than 25 feet to any building air intake.
- Building engineers utilize a vendor supplied preventative maintenance system.
- Gold Camp Data Center meets the minimum ventilation rate required in Section 120.1(c)2 of Title 24 for 1 hour before occupancy.

Integrated Pest Management

Department staff and contracted pest management companies will follow an integrated pest management (IPM) strategy that focuses on long-term prevention of pest problems through monitoring for pest presence, improving sanitation, and using physical barriers and other nonchemical practices. If nonchemical practices are ineffective, [Tier 3 pesticides](#) may be used, progressing to Tier 2 and then Tier 1 if necessary.

CDT uses an internal intranet web page to communicate with staff when the pest management vendor is scheduled to spray any chemicals that may affect staff. Staff are highly encouraged to eat in the designated breakrooms to avoid pest infestations in the office space areas. Staff are aware to contact the Facilities Unit in the event they encounter or have any issues with pests.

CDT's current pest control contract expires 12/31/2017. IPM has been incorporated into the statement of work for the next pest control contract. CDT currently requests contracted pest vendor to follow an IPM strategy and only use pesticides when necessary.

Contractor to use or supply environmentally sustainable products, as applicable. This includes any non-chemical control methods and any "least-toxic" pesticide formulations. The contractor shall only use these products and/or methods with the approval of the California Department of Technology contract manager or designee.

Table 4: Pest control contracts

Pest Control Contractor	IPM Specified (Y/N)
Bugman Pest Control	No

Environmentally Preferable Purchasing

State agencies are required to purchase and use environmentally preferable products (EPP) that have a reduced effect on human health and the environment when compared with competing goods that serve the same purpose.

Reducing Impacts

The environmental impact of the goods we buy is often larger than the impact of our own department operations. Our department is committed to reducing the environmental impact of our goods and services we purchase.

- CDT realizes the value and importance of exercising the purchase power of the State in energy efficient products in order to conserve electrical power and lower energy costs to

State agencies. CDT is committed to purchasing products that meet the Federal Energy Management Program (FEMP) recommended standards. Products that meet FEMP recommended standards display the Energy Star Label. In addition, CDT utilizes recycled content products and considers recycled products in conducting its purchasing activities.

- CDT solicitation documents require that vendors submit recycle content information on all goods purchases. This recycle content information is then tracked in the CDT contracts database (PeopleSoft Financials System) and the data is reported annually to the Reportable Product Category requirements set forth by the State Agency Buy Recycled Campaign (SABRC). CDT has met and continues to meet recycle goals consistent with statewide goals established by the Department of Resources Recycling and Recovery (CalRecycle).
- CDT purchase analysts rely on the program area submitting the purchase request to identify the necessary specifications on all IT and Non-IT goods purchases. In addition, CDT purchase analysts refer to the DGS Statewide Commodity contracts list to identify mandatory purchase contracts in existence that may offer EPP or SABRC compliant products. CDT Procurement incorporates as many recommended improvement practices as directed by the DGS EPP program or requested by CDT Facilities.
- CDT Procurement have made commitments in purchasing only printing and copy paper, desk notepads, and a majority of other office paper supplies with a minimum postconsumer recycled content (PCRC) of 30%.
- CDT Facilities unit verifies that DGS custodial staff purchase only Green Seal (GS) -08 janitorial supply products. In the event custodial staff require cleaners without Green Seal certification, the Facilities unit is notified before the product is purchased.

Measure and Report Progress

Purchasing branch does not have EPP purchasing strategies at this time. CDT Procurement will incorporate as many recommended improvement practices as directed by the DGS EPP program or requested by CDT Facilities. CDT Procurement makes every effort to incorporate EPP criteria in the goods and services the department purchases.

CDT Procurement's goal is to complete, at minimum, the following strategies to be completed by the end of the 2018 calendar year:

- Measure percent EPP spend in comparison to non-EPP spend
- Embed sustainability roles and responsibilities into purchasing procedures

Table 5: State Agency Buy Recycled Campaign 2016 Performance

Product Category	SABRC Reportable Dollars	SABRC Compliant Dollars	% SABRC Compliant
Antifreeze	0		
Compost and Mulch	0		
Glass Products	0		
Lubricating Oils	0		
Paint	0		
Paper Products	0		
Plastic Products	\$ 14,670,936	\$ 395,165.18	72.01%
Printing and Writing Paper	19,992	19,992	100%
Metal Products	0		
Tire Derived Products	0		

Tires	0		
-------	---	--	--

Sustainability Development and Education

CDT buyers have not completed any EPP training. However, CDT Procurement will be highly encouraging staff to complete the EPP training course offered by DGS' CalPCA program. The goal is to have 100% of Procurement staff complete the EPP training course by the end of the 2018 calendar year.

Location Efficiency

Location efficiency refers to the effect of a facility's location on travel behavior and the environmental, health and community impacts of that travel behavior including emissions from vehicles. Locating department facilities in location efficient areas reduces air emissions from state employees and users of the facilities, contributes to the revitalization of California's downtowns and town centers, helps the department compete for a future workforce that prefers walkable, bikeable and transit-accessible worksites and aligns department operations with California's planning priorities.

Our department's goal is that the average location efficiency score for all new leases be 10% higher than our average upon the next lease renewal.

While none of our leases are currently set to expire, the Smart Location scores of each of our leased facilities was calculated in Table 8. The Department's Sustainability Coordinator is currently working with Regional Transit (RT) to determine where RT should add additional bus lines to meet the needs of employees working at our locations. This partnership should yield additional bus lines, therefore improving the overall Smart Location Score.

Table 8: Smart Location Score for new Leases

Facility name	Smart Location Calculator Score	Lease Expiration
101173 Croydon Way Suite 4	75	8/31/2024
10860 Gold Center Drive	58	3/31/2025
10911 White Rock Road	58	3/31/2025
1325 J St	93	6/30/2021
Average	71	N/A
Baseline	58	N/A
% change from Baseline	13	N/A

Table 9: Lowest Smart Location Score Leases

Facility name	Smart Location Calculator Score
101173 Croydon Way Suite 4	75
10860 Gold Center Drive	58
10911 White Rock Road	58

CDT does not plan to execute any new leases and therefore will not be conducting site searches.

SUSTAINABILITY MILESTONES & TIMELINE

2012	- EXECUTIVE ORDER B-18-12 & B-16-12 ISSUED - NEW & RENOVATED BUILDINGS EXCEED T-24 BY 15%
2013	- BUILDINGS <10,000 SQ. FT. MEET CALGREEN TIER 1 - BEGIN WATER USE BENCHMARKING
2015	- LEED-EB CERTIF. FOR ALL EXIST. BLDGS >50,000 SQ. FT. - REDUCE WATER USE 10%
2016	- 10% OF FLEET LDV PURCHASES ZEV - REDUCE WATER USE 25% FROM 2013 TO FEB 28, 2016
2018	- 20% ENERGY USE REDUCTION
2020	- 50% OF NEW & RENOVATED BUILDINGS ZNE - REDUCE WATER USE 20% - 25% OF FLEET LDV PURCHASES ZEV
2025	- 100% OF NEW & RENOVATED BUILDINGS ZNE - 50% OF EXISTING BUILDINGS ZNE

DEPARTMENT STAKEHOLDERS

Greenhouse Gas Emissions	
Facility and Administrative Services Branch	Mark Standley, Facility and Administrative Service Branch Manager Ian Noumov, Senior Information Systems Analyst Freddie Sells, Facility Services & Physical Security Analyst Sarah Do, Sustainability Coordinator

Building Design and Construction	
Facility and Administrative Services Branch	Mark Standley, Facility and Administrative Service Branch Manager Ian Noumov, Senior Information Systems Analyst Freddie Sells, Facility Services & Physical Security Analyst Sarah Do, Sustainability Coordinator

LEED for Existing Buildings Operations and Maintenance	
Facility and Administrative Services Branch	Mark Standley, Facility and Administrative Service Branch Manager Ian Noumov, Senior Information Systems Analyst Freddie Sells, Facility Services & Physical Security Analyst Sarah Do, Sustainability Coordinator

Indoor Environmental Quality	
Facility and Administrative Services Branch	Mark Standley, Facility and Administrative Service Branch Manager Ian Noumov, Senior Information Systems Analyst Freddie Sells, Facility Services & Physical Security Analyst Sarah Do, Sustainability Coordinator

Integrated Pest Management	
Facility and Administrative Services Branch	Mark Standley, Facility and Administrative Service Branch Manager Freddie Sells, Facility Services & Physical Security Analyst Sarah Do, Sustainability Coordinator

Environmentally Preferable Purchasing	
Acquisition/IT Program Management	Marissa Duarte-Lott Acquisitions Supervisor

Location Efficiency	
Facility and Administrative Services Branch	Mark Standley, Facility and Administrative Service Branch Manager Freddie Sells, Facility Services & Physical Security Analyst Sarah Do, Sustainability Coordinator