



BUDGET FISCAL YEAR 2018
FACILITIES OPERATIONS

NOAO-S

Nicole van der Blik, Pilar Viera

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NOAO-S Facilities Operations

Executive Summary

In this report the fiscal year 2018 (FY2018) annual budget for the NOAO-S Facilities Operations Department (hereafter Facilities Operations) is discussed. Facilities Operations maintains the common infrastructure on the AURA recinto (including the recinto hotel) in La Serena and the AURA-Observatory near Vicuña, i.e. telescopes and facilities located on Cerros Tololo and Pachón.

In FY2016 Facilities Operations initiated a program of upgrading and improving the common infrastructure. This program includes continuous improvements, the implementation of a rigorous maintenance plan, training and certification of staff, and where necessary, an increase in the staffing levels. An outline of the plans and budget outlook for 2017, 2018 and 2019 can be found in the report “Outlook Budget Fiscal Years 2017-2019”, v1.2, Feb. 15 2016”¹.

The FY2018 base budget is 2546 MCLP. This base budget consists of the costs corresponding to on-going activities, i.e. operations, maintenance, minor routine upgrades as well as training. As of FY2018 it furthermore includes the costs for the transportation services, i.e. busses to Cerro Tololo and Cerro Pachón as well as a carry-all service. The total budget for these transportations services is 195 MCLP, including overhead and taking into account internal sales. The FY2018 base budget without the costs for transportation is 2351 MCLP which is a 13.7% increase compared to the FY2017 base budget of 2068 MCLP, whereas it is an increase of 0.6% compared to the forecast in the report “Outlook Budget Fiscal Years 2017-2019” ; in short we remain on track for the long term plan presented before FY17.

The FY2018 budget for critical projects is 233 MCLP, consistent with allocating an additional 10% of base budget for projects, as proposed in the report “Outlook Budget Fiscal Years 2017-2019”. Note, 233 MCLP is 10% of the FY2018 base budget excluding the budget for the transportation services.

The total, baseline budget for Facilities Operations includes both base services and projects and is 2779 MCLP. Without the transportations services, the baseline budget totals 2584 MCLP, as projected in 2016, and this compares to 2245 MCLP in FY2017, or a 15.1% increase.

All costs to provide the services are recovered through charges to the users: mountain share, census and per-use charges. The charges are calculated yearly and are based on the estimated costs for providing the services and a cost-sharing model (van der Blik & Heathcote 2014). Charges for the mountain share are calculated based on the “Two-Mountain Model”, census charges are based on the number of employees per program, and per-use charges are based on the estimated usage of these services. The FY2018 charges are presented in the Table 4 in this report.

¹ NOAO-S Facilities Operations reports can be found on: www.ctio.noao.edu/noao/content/Reports-and-documentation

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1. Introduction

The NOAO-S Facilities Operations Department (Facilities Operations) maintains the common infrastructure for AURA-O and the programs and smaller tenants present on the AURA-O property in La Serena and the property “El Totoral” near Vicuña where Cerro Tololo and Cerro Pachón are located. This includes road maintenance, maintenance of the common electric power systems, water and wastewater systems and the communication system. Facilities Operations also manages the restaurant and hotel facilities on the two mountaintops as well as the hotel service on the La Serena recinto. The Facilities Operations department furthermore oversees the guard service, reception and the transportation services and maintains the common areas. A detailed description of the services provided by or supervised by the Facilities Operations department can be found in the Service Level Agreement July 22, 2014. Included in the services, but under direction of the NOAO-S safety engineer, is the emergency medical service.

The department operations costs are fully recovered through charges to the programs and visiting astronomers. The charges for the services are calculated annually on the basis of the yearly budget and a cost-sharing model agreed upon by the programs. Departmental overhead, i.e. management of the department and groups, is distributed over the cost centers in terms of percentage of the budget per cost center. Services provided internally, to other groups within the NOAO-S Facilities Operations Department, are charged an internal rate, i.e. without overhead, to avoid double charging of overhead in the cost center using the service. Indirect costs associated with the NOAO Director’s Office (in Tucson) and Business Administration charged to NOAO by AURA CAS and AURA HR are added to direct costs at a rate of 4.8%. The 4.8% represents the “All-sites” portion of NOAO General and Administrative (G&A) rate charged to externally funded projects. All NOAO rates are developed with the assistance of AURA-CAS and submitted to NSF for approval on an annual basis.

The budget is primarily based on the previous year’s budget and other long-term experience regarding costs for goods and services in Chile. An adjustment for inflation is made each year, along with discretionary corrective adjustments to the budgets for specific services. For FY2018 we assumed an inflation of 4%. Planned upgrade and improvement projects are also included in the budget. For all administrative and operational activities in Chile, direct accounting is in Chilean Pesos (CLP). Correspondingly, all monetary figures in this report are in CLP and, charges for the services are calculated and charged in CLP. US dollar budgets are obtained using a peso to dollar exchange rate of 630 CLP/USD consistent with the other AURA centers operating in Chile.

2. Transportation service included in Facilities Operations budget

Facilities Operations manages three transportation services to the mountains: busesto Cerro Tololo and Cerro Pachón and a carryall to both mountains. As of FY2018 the costs for these transportation services are included in the Facilities Operations budget to be able to recover the overhead associated with these services through the cost-sharing model. The costs will be recovered from the programs through per-use charges. This is not a new cost, just a reorganization of transportation services into Facilities Operations which is where the activity is actually managed.

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2.1. History of the shared transportation services

The bus service to Cerro Pachón has been managed by Facilities Operations since March 2008, when NOAO, Gemini and SOAR agreed to share the bus service to the mountain. The direct costs for this service, i.e. bus contract and meals for bus driver, were split equally between Gemini-South and NOAO, as were the number of seats, 19 each. Until October 2017 no overhead was charged to the programs.

The NOAO share included seats for personnel from CTIO and SOAR as well as Facilities Operations, which became part of NOAO in 2009. The bus went directly to Cerro Pachón with a stop at El Quisco. NOAO personnel going to Cerro Tololo transferred at El Quisco to vehicles provided by and funded by NOAO-S. From El Quisco the bus continued to Cerro Pachón, and when the new casino on Cerro Pachón came into use, June 4th 2012, this bus service dropped staff off at the casino, and after breakfast shuttled staff to the Pachón summit. The bus also provided transport to and from the casino at lunchtime for Gemini and SOAR staff.

2.2. Second bus service, directly to Cerro Tololo

In November 2016 a bus service was contracted to take personnel up to Cerro Tololo directly. The cost for this bus service is shared between CTIO and Facilities Operations, based on the number of seats assigned. The seats freed up in the Pachón bus were distributed between NOAO, LSST and Facilities Operations, and costs are distributed accordingly; the Pachón bus continues to provide transport to and from the Casino at meal times

2.3. Carryall service to Cerro Tololo and Cerro Pachón

A shared carryall service was started in March 2013, serving both mountains twice per day. Gemini and NOAO share the cost for this service. Until October 2017, no overhead was charged to the programs. Visiting astronomers are charged a fixed rate.

2.4. Recovering overhead associated to transportation services

As mentioned in the previous subsections, the overhead costs associated with the Pachón bus and the carryall services were not passed on to the programs using these services. In FY2017 it was agreed to correct for this. However, as the FY2017 budget and charges were already approved and communicated, we opted for adopting an ad-hoc overhead rate in FY2017, leaving the proper inclusion of these services in the cost-sharing model to FY2018. The overhead rate was set to 14%, based on the FY2017 overhead rate on all cost centers related to services.

In FY2018 the costs for the transportation services are included in the cost-sharing model. This way overhead is properly distributed, and furthermore, the seats used by Facilities Operations staff are charged an internal rate to avoid double charging of departmental overhead. For the bus services to Cerro Tololo and Cerro Pachón an annual rate per seat is calculated in the cost-sharing model. The programs will be charged a monthly rate, based on the number of seats assigned to the program at the beginning of the fiscal year. For the carryall service a rate per ride is calculated.

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3. The FY2018 plan & FY2018 budget

The FY2018 budget is presented in Table 1. This totals 2779 MCLP, covering all cost centers, departmental overhead and the AURA Business Service Charges (accounting, procurement, HR, AURA indirects) and it includes the budget for regular operations and critical projects. The base budget for regular operations is 2546 MCLP, including 195 MCLP for the transportation services discussed above. The FY2018 budget for critical improvement and upgrade projects is 233 MCLP. The budget for regular operations was 2068 MCLP in FY17, not including the budget for the transportation services, while there was 177 MCLP budgeted for the FY2017 improvement and upgrade projects.

There are some notable increases in the regular operations budget compared to FY2017. The budget for “Contracted Services” almost doubled and so did the budget “Travel Expenses”. Both increases are related to the transportation services. The bus and carryall contracts are now included in the cost sharing model, i.e. “Contracted Services” now includes 46 MCLP for the annual cost of the carryall contract, 103 MCLP for the Pachón bus contract and 54 MCLP for the Tololo bus contract. Other additional contracted services, which are included in the base budget, are the installation of guard rails on the main road (33 MCLP), replacement of 10 electric poles for the mountain power lines (30 MCLP), and regular maintenance of workshops and other buildings for general use by Facilities Operations (40 MCLP). The “Travel Expenses” budget, which reflects the budget for bus and carryall usage by Facilities Operations staff, has increased because there are more seats available for and used by Facilities Operations.

Extra staff hired in FY2017 and to be hired in FY2018 result in an increase in the budget under “Payroll and Fringe Benefits Expense”, an increase in “NOAO South Services”, as well as in increase in internal sales, in particular more meals consumed by Facilities Operations. Note that internal sales now also include transport used by Facilities Operations staff.² The item “NOAO South Services” accounts for work by Maintenance and Garage groups on buildings, heavy equipment or vehicles operated and maintained by the Facilities Operations. The annual provision for severance funds (15 MCLP) is budgeted under “Miscellaneous Expense” rather than “Contracted Services” as it was in FY2017.

The FY2018 budget for “Capital Equipment” includes about 30 MCLP for renewal of electric equipment, equipment for the Maintenance group and the garage and kitchen equipment. The budget for “Freight” in the work package Reception was decreased by 15 MCLP, to reflect the actual cost of freight over the last few years.

In addition to regular operations, we plan to carry out several outstanding improvement and upgrade projects in FY2018. The costs for these projects are included in the FY2018 budget and the projects are discussed in detail in Section 5, “FY2018 Projects”.

Some of the projects planned for in FY2016 (e.g Pachón kitchen extension) and FY2017 (e.g. improvements to water supply system) have not been carried out yet. Funds allocated to those projects are carried forward to FY2018 to allow for execution of these projects in FY2018. The status of the projects is reported on every quarter and expenditures are tracked per project. We expect to complete upgrading

² To clarify, services provided internally from one cost center to another, will show up as income (internal sale) in the first cost center, while it is expensed in the latter. For example, for a road worker taking the bus up and down the mountain, and having breakfast and lunch on Cerro Tololo, there will be meals and transportation as expenses in the road maintenance cost center while the kitchen and transportation cost centers will be credited through internal sales.

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most equipment and infrastructure to meet Chilean Health and Safety standards during FY2018 and FY2019. This is taking longer than we anticipated when preparing the three-year plan for Facilities Operations, partly driven by funding and partly driven by the pace in which we are able to hire staff with the expertise and experience necessary. Once equipment and infrastructure has been upgraded, we will be able to maintain the quality of service by including upgrade and improvement projects yearly. Note that we do expect that road repairs will continue in the coming years, both on the mountains and on the La Serena recinto.

The upgrade and improvement projects require “Supplies & Materials”, “Contracted Services”, and “Capital Equipment”. Departmental overhead, i.e. “Facilities Support”, and the Business Service Charges are also included in the budget of these projects.

4. Details per work package

In Table 2 the budget per activity, or work package, is presented with information on the budgeted cost for labor, non-payroll and internal sales. The table is divided into three parts, grouping the work packages by mountain share, census, and per-use services.

In this Section we discuss the general operations and safety work packages. We also discuss work packages with significant budget changes, with the exception of the work packages “FY2018 Projects”, which are discussed in Section 5.

4.1. Safety, General operations

The work packages “Safety & General Ops” and “Mnt General Ops” include training and certification, maintenance and renewal of the Facilities Operations fleet as well lease contracts for three vehicles that travel up and down on a nearly daily basis. The work package “Mnt General Operations” covers general operations costs for mountain infrastructure, while the work package “Safety & General Operations” covers safety and general operations costs for all departmental activities, independent of location.

In comparison with FY2017 the budget for the work package “Safety and General Ops” increased by more than 37%. This is mostly due to planned maintenance of general facilities used by Facilities Operations staff, such as the workshops and garage, but it also adjusts the budget for IT support based on FY2017 actuals.

4.2. Reception, La Serena Common areas and Communications Network

The budget for the work packages “Reception”, which covers the cost of the reception and handling of the mail for all programs, is decreased by 15 MCLP to reflect the actual cost of freight over the last few years.

The work package “La Serena Common areas” includes the maintenance of the common areas, as in gardens, as well as rodent prevention. The FY2018 budget includes an upgrade of the facilities (lunch area, bathrooms, lockers) for the contractors, which are currently substandard, increasing the budget by 16% compared to FY2017. The work packages “Communications Network”, for the mountains and the La Serena recinto, comprise of the maintenance of the radio communication system and the telephone

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system. Based on FY2017 actuals, an increased effort by staff is budgeted in this work package for FY2018 increasing the budget by 19% compared to FY2017.

4.3. Security and Emergency Medical Services

The work packages “Security Mnt”, “Security La Serena” and “Emergency Medical Services” include services provided through external contractors and, a large fraction of the budget for those work packages consists of the costs of those contracts. Upgrades to the accommodation for the guards and paramedics/nurses are budgeted for in these work packages as well. In FY2018 we plan to upgrade the water supply system for the guards at Control Puerta at the entrance of the mountain premises. This is reflected in the non-payroll budget for the “Security Mnt” package. The budget for the work package “Emergency Medical Services” also includes meals & lodging for medical personnel.

4.4. Maintenance of Roads, Power Lines and Power Generation

The work packages “Road Maintenance”, “Power Line Maintenance” and “Power Generation” contain the effort for maintaining common mountain infrastructure: roads, power lines and the equipment in the Tololo power house. Staffing in these work packages have been increased, to provide safe and reliable services. The budget for road maintenance increased from 238 MCLP to 291 MCLP, or 22%, to account for an additional operator and addition contracted road works, such as the installation of 1km of guard rails per year, which are considered part of regular maintenance, but were hitherto not included in the base budget. Similarly, the budget for contracted work on the power lines, such as replacing poles of the power lines to the mountains and regular analysis of the state of transformers, are now included in the base budget, increasing the budget from 132 MCLP to 182 MCLP, or 37%. The budget for power generation on Cerro Tololo, which was underestimated in previous years, has been increased by 44% from 27 MCLP to 39 MCLP, to cover the cost of generator maintenance carried out by the garage, i.e. budgeted as NOAO-South Services.

4.5. Kitchen and Hotel Services

The work packages “Mnt Kitchens”, “Mnt Hotels” and “La Serena Hotel” contain the effort to provide meals and lodging on the mountains and lodging in La Serena. The usage of these three services is expected to be significantly more in FY2018 than in FY2017, resulting in an increase in the corresponding budgets. In particular the budget for the work package “Mnt Hotel” increases by 33% compared to FY2017. This includes an increased janitorial effort. The budget for the work packages “Mnt Kitchen” and “La Serena Hotel” are 12% and 13% more than in FY2017 respectively, somewhat more than expected based on IPC and salary increases.

4.6. Water & Sewage and Water Transport

The work packages “Mnt Water & Sewage”, “Water Transport” and “La Serena Water & Sewage” contain the effort to provide water on the two mountains and in La Serena. The La Serena work packages also include the costs for usage of the municipal sewage system. The budget for the “Water Transport”, which includes the work on the water storage tank on Cerro Pachón and the budget for the “LS Water & Sewage” both increased by about 20% compared to FY2017 to cover improvements on these systems to

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be carried out in-house. The “La Serena Water & Sewage” work package also accounts for extra costs for usage of water from Aguas Del Valle.

Following issues with water quality on the recinto in FY17, AURA and NOAO South executed an independent review of the waters system on the recinto, the guardhouse at the Tortoral gate, and on both mountains. Modest improvements have been completed under NOAO South Facilities Operations or will be executed as described below. More significant (costly) improvements will be made under the use of separate NSF funds (Management Fees) as appropriate. Such projects would be done mostly through external contracts.

4.7. Janitor Service, Maintenance Group and Garage

The work packages “Mnt Janitorial Service”, “La Serena Janitorial Service”, “Maintenance Group”, and “Garage” contain the services that are provided on an hourly basis. In FY2017 the meals and transportation for the mountain janitors was not accounted for. In FY2018 this was correctly budgeted, resulting in an increase of 21% in the budget for the work package “Mnt Janitorial Service”. A second plumber was hired in the second half of FY2017, and with the new bus service to Cerro Tololo bus seats are available for the entire maintenance group, increasing both the budget in payroll and non-payroll. However, with the additional staff member more work will be carried out, in particular internal to the department, so that the net budget for the Maintenance group will go up roughly in line with IPC and salary increases only.

The budget for the work package “La Serena Janitorial Service” increased by 7% compared to FY2017, to cover costs for vacation replacements. Furthermore, up to FY2018 cleaning materials were paid for from a NOAO-South account, rather from the Facilities Operations “La Serena Janitorial Service” account; this is corrected in FY2018.

The budget for the work package “Garage” decreased by almost 50% due to a significant increase in the estimated internal sales based on FY2017 actuals.

5. FY2018 Projects

In this Section we discuss the upgrade and improvement projects planned for in FY2018. The costs associated with these projects are presented in Table 3. These costs are recovered through the “FY2018 Projects Share Charge”: 118 MCLP for the projects common for both mountains, recovered through the common part of the Mountain Share Charge; 22 MCLP for the Tololo specific projects, included in the Tololo Mountain Share Charges; and, 43 MCLP for the Pachón specific projects, included in the Pachón Mountain Share Charge.

5.1. Water & Sewage System

In FY2017 an external consultant reviewed the water supply systems in La Serena and on the mountain. Based on their recommendations a water system upgrade plan has been developed consisting of several larger projects, including major maintenance of the storage tanks, upgrades of the storage tanks, upgrades or renovation of booster pumps. The following subset of projects is planned for in FY2018:

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- Maintenance of the hydro-pneumatic tank Cerro Tololo, or alternatively replacement of this tank
- Maintenance of water storage tank on Cerro Pachón
- Maintenance of water storage tank in recinto La Serena

In addition we plan to upgrade the electric systems in the pump houses, which are part of the system pumping the water from the well in Quebrada San Carlos up to the storage tanks on Cerro Tololo.

5.2. Road Maintenance

In addition to regular maintenance, major improvements on the main roads to Cerro Tololo and Cerro Pachón are underway: the culverts and gabions at km 27 were replaced, and the wash out at km 30 is being repaired. This project was budgeted for in FY2016, and is being carried out in FY2017.

In the second half of calendar year 2017, we are installing and upgrading the drainage system of the main mountain road, and we are purchasing a new road grader. These two projects are financed through the AURA Major Improvement Projects Plan.

To improve safety of the main road, we include the cost for installation of 1km of guardrails in the base budget for road maintenance starting in FY2018. Furthermore, we plan to install an additional 3km of guardrails in FY2018 to improve the critical areas of the road and to replace guardrails that have been damaged.

Several larger road refurbishment programs will be planned and executed under separate NSF funds through center based Management Fees. Such projects would be externally contracted to not disrupt the Facilities Operations FY2018 work plan.

5.3. Building maintenance & upgrades

The base budget includes funds for regular maintenance of the buildings, such as hotel buildings, workshops and other buildings used by Facilities Operations. In FY2017 we carried out maintenance on several of the hotel buildings. In FY2018 maintenance of the carpentry workshop on the mountain and the garage in La Serena are planned for. We also plan to commence the upgrade of the Round Office Building (ROB) on Cerro Tololo where the Facilities Operations mountain offices are located. This upgrade project will include replacing the heating system to comply with Chilean health and safety standards and repairing the roof. This maintenance project will continue into FY2019.

6. The cost recovering charges for FY2017

The FY2018 charges to recover the costs of maintaining the infrastructure and providing the services are presented in Table 4. The charges are based on the costs for providing the services and are calculated based on the “Two-Mountain Model” in the case of Mountain Shares, on number of employees, in the case of census charges, and on the estimated usage in the case of per-use charges. The estimated cost per program for FY2018 is listed in Table 5.

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6.1. Mountain Share Charges

Mountain share charges are calculated based on the Two-Mountain Model, described in “Two Mountain Share Model 2016, v5³ by Heathcote & van der Blik. Cost for infrastructure common to both mountains is split 50/50 over the two mountains, Cerro Tololo and Cerro Pachón. The cost for infrastructure on Cerro Pachón and the “Pachón-share” of the common infrastructure is split between LSST, Gemini-S and SOAR, whereby LSST and Gemini-S each count as one share, and SOAR as 0.8 of a share. The cost for infrastructure on Cerro Tololo, and the “Tololo-share” of the common infrastructure is split between the tenants / programs, proportional to the diameter of the telescopes, with a reduction of 70% for remote telescopes, and telescopes which are in use less than one third of the year. Some telescope projects have changed or will be changing configuration or mode of operation in FY2018, e.g. a telescope is added, or instead of full year operation the project will run part time in FY2018 or vice versa. These changes are included in the calculation of the FY2018 Tololo Mountain Share Charges.

The mountain share charges are split up in Base and Project, see Table 4. The base charge, or regular share charge covers routine maintenance of the infrastructure, while the project charges covers the critical improvement and upgrade projects.

Compared to the FY2017 the Mountain Share Charges increase by 16% for both the Cerro Tololo and the Cerro Pachón based programs. This increase corresponds to a 16% budget increase for the work packages financed by Mountain Share Charges, partially due to inflation and salary increases, although the base budget for regular maintenance, and for maintenance of the roads, power lines and power generation, also increased as discussed in Section 4. Furthermore, the budget for the critical projects increased from 177 MCLP in FY2017 to 233 MCLP in FY2018, the latter being in line with the budget forecast presented in 2016.

6.2. Census Charges

The “All Places, All Staff” census charge covers the costs for reception, including the mail pouch to Santiago and the USA, and general safety and operations for all areas under supervision of the Facilities Operation department. The census charge for La Serena based staff covers the costs for the communications network (telephone and radio communications), the La Serena guard service, maintenance of the common areas and, the La Serena based projects. Note, the costs for the common areas, mostly water and the gardener service, are shared with the residents of the La Serena recinto; only the part corresponding to the programs is included in the NOAO-S Facilities Operations budget.

The FY2018 “All Places, All Staff” census and “La Serena” census charges increase by 18% and 9% respectively compared to FY2017. These increases correspond to increased budgets for the cost centers included in these census charges, which have been discussed in Section 4.

6.3. Charges for the Per-Use Services

The charges for the Per-Use Services depend very much on the estimated quantity of use, and as a result can fluctuate from year to year even if the budget for the cost centers does not vary very much.

³ http://www.ctio.noao.edu/noao/sites/default/files/Facilities/Documents/TwoMountainModelDescriptionV5_Signed.pdf

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The charge for water delivered to Cerro Pachón increases by 19% compared to the FY2017, partly because of an increased budget as discussed in Section 4, and partly because with LSST entering a different phase in the construction project, the water consumption on Cerro Pachón is expected to go down.

The charge for water usage on the La Serena “recinto” increases by 18% corresponding to an increase in budget for the work package “Water and Sewage La Serena” as discussed in Section 4. La Serena water usage is estimated to be comparable to FY2017.

The charge for the Mountain Janitorial Service increases by 21% to properly account for meals and transportation costs for the janitors working on the mountain.

All other per-use charges increase by a few percent only. Increases range from -1% for Water used on Cerro Tololo to 8% for the hourly rate of the Maintenance group, consistent with IPC and salary increases. Note that for the usage of the Cerro Pachón hotel an extra charge of 16,201 CLP is included to pay off the debt with AURA for building the Hotel Pachón.

As discussed in Section 2, the cost for the transportation services will be recovered through the cost-sharing model starting in FY2018. For the bus services to Cerro Tololo and Cerro Pachón an annual charge per seat is calculated, while for the carryall service a charge per ride is calculated. These per-use charges are included in Table 4.

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Table 1: NOAO-S Facilities Operation FY2018
The FY2017 base budget and projects budget are included for comparison.

	Budget FY 2018 Base	Budget FY2018 Projects	Total Budget FY 2018	Budget FY 2017 Base	Budget FY 2017 Projects
TOTAL REVENUES	2,546,411,139	233,024,486	2,779,435,625	2,068,390,227	176,531,395
Payroll and Fringe Benefits Expenses	1,064,074,778	-	1,064,074,778	974,212,380	-
Supplies & Materials	583,186,411	8,112,000	591,298,411	574,469,198	1,705,680
Utilities & Office Expense	233,619,698	-	233,619,698	236,293,115	-
Equipment Repair & Maintenance	-	-	-	-	-
Equipment & Building Leases	-	-	-	-	-
Travel Expenses	68,738,807	-	68,738,807	35,556,012	-
Foreign Travel - Staff	523,261	-	523,261	503,136	-
Miscellaneous Expense	23,924,090	-	23,924,090	3,003,933	-
Insurance	2,072,441	-	2,072,441	1,992,732	-
Conferences & Mtgs\Training	16,415,961	-	16,415,961	16,885,978	-
Contracted Services	707,493,150	86,996,000	794,489,150	381,991,029	52,635,960
NOAO South Services	174,321,963	-	174,321,963	118,821,900	-
Recruitment - Ads & Misc Exp	107,560	-	107,560	103,424	-
Facility Support	(42,342,982)	42,342,982	0	(29,990,692)	29,990,692
Freight	13,274,427	-	13,274,427	27,763,872	-
Capital Equipment	65,664,340	86,840,000	152,504,340	33,814,688	84,559,500
Non-Payroll Expenses Subtotal	1,846,999,127	224,290,982	2,071,290,109	1,401,208,325	168,891,832
Internal Sales	(516,607,155)	-	(516,607,155)	(416,424,727)	-
Business Service Charges	151,944,389	8,733,504	160,677,893	109,394,248	7,639,563
TOTAL EXPENSES	2,546,411,139	233,024,486	2,779,435,625	2,068,390,227	176,531,395

Note on Expense Code "Facilities Support": Departmental overhead is distributed over the cost centers in terms of percentage of the budget per cost center. The FY2018 base budget includes the costs of this overhead, but only part of the "revenue". The remainder of the "revenue" is budgeted in the work package "FY2018 Projects". The FY2018 base budget shows a negative "Facilities Support", matching the "Facilities Support" in FY2018 Projects.

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Table 2: Labor & non-payroll, per work package
The FY2017 budget is included in the last column for comparison.

Shared mountain infrastructure & services

Work Package	Labor	Non-Payroll	Total Budget	FY2017 Budget
Mnt General Ops	42,859,165	203,265,984	246,125,149	260,751,924
Security Mnt	0	39,580,289	39,580,289	30,883,041
Emergency Medical Services	41,812,821	144,335,922	186,148,743	175,256,848
Road Maintenance	45,627,061	245,609,683	291,236,744	237,766,837
Power Line Maintenance	34,537,204	147,070,326	181,607,530	132,233,271
Power Generation	8,887,636	29,786,212	38,673,848	26,903,498
Communication Network	4,448,883	21,914,507	26,363,390	26,286,870
	178,172,770	831,562,922	1,009,735,692	890,082,290
FY2018 Projects	0	223,700,842	223,700,842	163,377,435
Total	178,172,770	1,055,263,764	1,233,436,534	1,053,459,725

General and La Serena common infrastructure & services

Work Package	Labor	Non-Payroll	Total Budget	FY2017 Budget
Safety & General Ops	23,883,860	105,099,478	128,983,338	93,809,177
Security La Serena	0	79,159,595	79,159,595	74,428,454
Common Areas	869,747	76,839,566	77,709,313	67,193,813
Reception	29,477,525	27,624,451	57,101,976	68,025,205
Communication Network	6,597,997	16,543,082	23,141,079	19,441,175
FY2018 Projects	0	9,323,643	9,323,643	13,153,959
Total	60,829,129	314,589,815	375,418,944	336,051,783

Per-use services

Work Package	Labor	Non-Payroll	Internal Sales	Net Budget	FY2017 Budget
Mnt Kitchens	216,296,586	453,615,889	(164,532,361)	505,380,114	452,944,344
Mnt Hotels	64,508,017	246,034,168	(56,126,728)	254,415,456	190,986,259
Mnt Car Rental	-	-	-	-	-
Mnt Water & Sewage	12,456,361	37,877,108	(28,380,981)	21,952,488	24,243,683
Mnt Water Transportation	13,551,794	22,492,464	(13,350,832)	22,693,426	19,023,067
Mnt Janitorial Service	13,455,910	18,275,898	(12,841,931)	18,889,877	15,590,373
LS Hotel	10,568,840	27,087,689	(457,945)	37,198,584	32,951,201
Garage	67,034,238	17,895,027	(67,951,912)	16,977,353	33,431,981
Carry-all	-	58,914,805	(12,779,255)	46,135,550	-
Bus Pachón	-	133,407,104	(15,601,542)	117,805,561	-
Bus Tololo	-	70,160,638	(39,151,014)	31,009,624	-
LS Water & Sewage	9,347,009	34,603,371	(11,904,459)	32,045,921	26,715,052
Maintenance Group	71,612,927	43,601,536	(92,249,916)	22,964,548	21,539,344
LS Janitorial Service	26,803,501	17,586,421	(1,278,277)	43,111,645	37,984,809
Total	505,635,183	1,181,552,118	(516,607,155)	1,170,580,146	855,410,113

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Table 3: FY2018 Improvement & Upgrade Projects

FY2018 Projects	Estimated Cost
Water & Sewage	
Upgrade Electric System Pump Houses	15,600,000
Upgrade Cerro Tololo Booster System	9,800,000
Maintenance Water Tank Cerro Pachón	7,000,000
Maintenance Water Tank La Serena	7,000,000
Road	
Install 3km of extra guard rails	107,500,000
Buildings	
ROB Roof Repair	15,600,000
ROB Upgrade Heating System	12,500,000
Overhead & IPC	
IPC	7,000,000
Business Service Charges	8,700,000
Overhead	42,300,000
Total	233,000,000

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Table 4: Cost recovering charges for FY2018
Mountain Share Charges consist of base charge and regular projects charge.
FY2017 charges are included in the last column for comparison.

FY2018 Mountain Share Charges, based on 2-mountain model

Program	Base	Projects	Share Total	FY2017 Share Total
CTIO 4M	145,369,948	29,667,588	175,037,536	153,316,448
KASI	58,587,385	11,956,711	70,544,095	61,790,004
SMARTS 1.5m	18,308,558	3,736,472	22,045,030	-
SMARTS 1.3m	47,602,250	9,714,827	57,317,077	50,204,378
PROMPT	40,754,849	8,317,387	49,072,236	42,982,672
SMARTS 0.9m	32,955,404	6,725,650	39,681,054	34,756,877
LCOGT	50,531,619	10,312,663	60,844,282	44,025,378
Other	18,308,558	3,736,472	22,045,030	19,309,376
LSST	187,172,461	44,495,423	231,667,884	199,016,919
GEMINI	187,172,461	44,495,423	231,667,884	199,016,919
SOAR	149,737,969	35,596,338	185,334,307	159,213,535

FY2018 Census Charges

	FY 2018	FY 2017	
La Serena Based	1,381,997	1,262,445	per employee, per year
All Places All staff Census	1,011,333	856,267	per employee, per year

FY2018 Per-use Charges

Mountain Facilities	FY 2018	FY 2017	
Water - Tololo	8,501	8,553	per cubic meter
Water - Delivered to Pachon	20,861	17,459	per cubic meter, includes transport
Tololo Meals	15,040	14,329	per meal
Tololo Lodging	33,850	32,349	per night
Pachon Meals	15,040	14,329	per meal
Pachon Lodging	50,051	48,550	per night, incl. 16,201 CLP for AURA loan
Janitorial Services	17,491	14,436	per hour
La Serena Facilities	FY 2018	FY 2017	
Garage - Labor	30,756	29,021	per hour
Maintenance Group - Labor	26,096	24,256	per hour
Janitorial Services	10,156	9,534	per hour
La Serena Hotel	43,660	42,245	per night
Water and Sewage La Serena	1,294	1,095	per cubic meter
Transportation			
Carry-all, Tololo & Pachón	54,150		per ride
Bus Tololo	3,445,514		per seat, per year
Bus Pachón	3,569,865		per seat, per year

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Table 5: Estimated Costs per Program for FY2018

Note: The Per-use Charges Total included the cost for the transportation to the mountain, i.e. busses to Cerro Pachón and Cerro Tololo and the carryall service to both mountains.

Estimated FY2018 Costs per program	Share Charges Regular	Share Charges Projects	Census Charges Total	Per-use Charges Total	Total per program, CLP	@630CLP/USD USD
LSST	187,172,461	44,495,423	28,349,302	246,049,088	506,066,275	803,280
GEMINI	187,172,461	44,495,423	162,174,494	244,508,647	638,351,025	1,013,256
SOAR	149,737,969	35,596,338	4,786,661	67,257,114	257,378,082	408,537
CTIO	145,369,948	29,667,588	132,612,540	362,031,675	669,681,751	1,062,987
SMARTS 1.3m + 1.5m	65,910,808	13,451,299	2,022,666	25,355,699	106,740,472	169,429
SMARTS 0.9m	32,955,404	6,725,650	-	-	39,681,054	62,986
Schmidt	-	-	-	-	-	-
URAT	18,308,558	3,736,472	-	-	22,045,030	34,992
PROMPT	40,754,849	8,317,387	-	-	49,072,236	77,892
LCOGT	50,531,619	10,312,663	-	-	60,844,282	96,578
KASI	58,587,385	11,956,711	-	28,312,042	98,856,137	156,915
T80S	18,308,558	3,736,472	-	1,452,876	23,497,906	37,298
WHAM	18,308,558	3,736,472	-	-	22,045,030	34,992
SARA	18,308,558	3,736,472	-	-	22,045,030	34,992
Mearth	18,308,558	3,736,472	-	-	22,045,030	34,992
Other, e.g. visiting astronomers	-	-	-	166,692,327	166,692,327	264,591
AURA (O, CAS, HR) Houses	-	-	45,473,280	-	45,473,280	72,180
	-	-	-	28,920,679	28,920,679	45,906
Total	1,009,735,692	223,700,842	375,418,944	1,170,580,146	2,779,435,625	4,411,803