Golden Rain Foundation
Ad Hoc Technology Committee

Strategic Technology Plan
Report

To the

Golden Rain Foundation
Board of Directors

Submitted December 20, 2018

Contents

Background

The Golden Rain Foundation (GRF) Ad Hoc Technology Committee was established by the GRF Board to deliver a Strategic Technology Plan analysing potential community technology needs for the next five years. The Committee report is to be completed by December, 2018.

The Committee's purpose as outlined by the GRF Board is as follows:

> "It shall be the purpose of this Committee to create a technology plan that anticipates GRF's technology needs for the next 5 years. It is expected that the plan will emphasize an integrated, systematic approach for identifying, prioritizing, implementing, and maintaining technology in order to enable GRF to:
>
> - Improve existing services.
> - Provide new services that are expected to be needed in the future.
> - Improve the effectiveness and cost-efficiency of maintaining GRF's physical properties.
>
> The technology plan will evaluate the estimated cost and benefit of its recommendations to ensure that the proposed technology is reasonable and affordable; and that the relative merits and disadvantages of each recommendation will be identified**.** The Committee shall report out its recommendations to the GRF Board on or before the GRF Board's December 2018 meeting."

This Strategic Technology 5-year plan describes the results of the Committee's work to date.

One of the Committee's first decisions was how to meld its views with those of a progressive staff and its own planned upgrades. It was resolved to include the staff-initiated upgrades and projects as part of the Committee recommendations.

What the reader will see is that the technology adoption recommendations are part of a cohesive whole adopted in conjunction with and the support of staff's own endeavours.

Executive Summary

In many ways, Rossmoor has been very progressive over the years and long ago adopted infrastructure and systems that were ahead of their time. Some of these systems are in various stages of being obsoleted or have a declining reliability. The recommendations in some areas such as upgrading the streetlights to LED technology or renewing the 21-year-old Fiber Optic data backbone are pretty simple – an upgrade is needed. Others such adding mobile connectivity to the 20-year-old core property management and accounting system, Jenark, are much more complex.

It's important to acknowledge that younger, more technology-familiar residents are likely to want to utilize web-enabled technologies to link them with member-related operational functions. Real-time, online, mobile connectivity and interactive transactions are key to meeting this expectation. Concurrently many older members, and some younger members, would prefer to make a phone a call or visit in person to make bookings or arrange travel.

The challenge faced by the Technology Committee has been to identify and recommend a path of progression from a face to face, largely manual paper-based environment, to a largely online world. It is recognized that there will always be a segment of our population that is simply not interested in the online world. Consequently, technology implementations must be done carefully and with the ability for our population to address services in a variety of ways: in person, via telephone or online.

On yet another front, there are developing technologies that potentially have much greater impacts on the day to day life in Rossmoor. The incredibly rapid development of electric vehicles, self-driving vehicles and on-call services all promise to have major impacts on the community.

Other significant technologies that reduce costs or enhance water savings are the use of low-cost drones for roof and property inspections, low water usage irrigation systems and self-contained sewage recovery systems for landscape watering.

In summary, the Committee has attempted to address a host of technology issues across a wide spectrum that will affect Rossmoor, its services and its costs in the next five years.

How the Committee Approached the Mission Statement

Shortly after the Committee was formed it went through a “splat on wall” brainstorming process to identify the total universe of projects that fit within our mandate. Initially, about 36 projects were identified, but was later pared down to approximately 25 projects. These were then grouped into categories.

Every Technology Committee member volunteered to act as Project Sponsor for one or more of the potential projects. Each Sponsor submitted a written Technology Project Description report (TPD), with sourcing and any back up documentation, to the full Committee for their review and input. Each Project Description went through multiple readings and edits by the full committee before a consensus was reached and the Project Description was considered complete. The Technology Project Descriptions provide extensive background information and are provided in the Appendix to the Ad Hoc Technology Committee Report.

The Committee was quite aware that the sheer detail and volume of some of its Technology Project Descriptions are a bit overwhelming. In order to evaluate and prioritize projects as well as give Board Members a shorter, less detailed view of each project the Committee created the Project Selection Criteria form, or PSC. The PSCs are in significant alignment with the GRF Board Planning Committee’s project

priority criteria. The PSC are summaries of the benefits, costs and impacts of each Technology Project Description and form the basis for this report. The Committee then grouped the projects categories of related projects.

Project Categories

We have identified 25 Projects and allocated them into 5 categories. The first two categories: **Highly Recommended** and **Recommended** are largely independent projects that stand-alone. These projects will enable the Board to evaluate each project as it stands based on cost, complexity and, human resource needs. Some projects, as is the case with Autonomous Vehicles, are dependent on the continued development of the enabling science underpinning the project.

The category, **Inevitable Project: Core IT System Upgrade,** is the heart of the Committee's deliberations and research. The Committee is firmly of the belief that many of Golden Rain Foundation services and amenities need to move to a more interactive online environment in the next 5 years. A website architecture that delivers secure network, data and log-on is key to member access to GRF transactions. Delivering a member-only portal will be critical to this process. This will involve the ability to log in online and schedule events, trips, golf reservations, yoga lessons and charge everything to a credit or debit card. The final decision on the system to be used in the future will drive much of the look and feel of many of the IT projects and is dependent on the long-term direction chosen by the Board. This section offers the Board the background and vocabulary necessary to evaluate several pathways to achieve this key strategic decision.

The **GRF Already Funded** category is self-explanatory. It is included simply to make the Board aware that the Committee took these projects into consideration in its deliberations. And, in the case of GRF EV charging, was a project initiated by Committee members.

Finally, the **Parking Lot Item** category is primarily a place holder for projects either out of scope for the Committee or applicable to the Mutuals. The Committee did not want useful information and research to be lost.

The categories and projects are:

Highly Recommended:
- Drone Technology
- Fiber Optic Cable Replacement
- Gateway Data Site Relocation
- LED Street Lighting
- On Demand Transportation Trial Project
- Solar System Common Areas
- TV/Internet Provider Alternatives

Recommended:
- Autonomous Vehicle Developments
- Business Intelligence Decision Support Software
- Document Scanning

Event Management and Room Reservations
Irrigation Watering Technology
Wi-Fi Coverage – Common Spaces

Inevitable Project: Core IT System Upgrade

Web Enabled Member Interaction
Data Integration
Jenark Upgrade and Implementation Standard
New CAM/Resident Services Software Solutions
Modern Online Infrastructure

GRF Already Funded:

Emergency Back Up Infrastructure
GRF EV Charging Stations
Robust Data Back Up System

Parking Lot

Dead Spots Cellular Coverage
Docu-Sign
Online Work Order System
Sewage Treatment / Water Reclamation Plant
Shared EV Charging Stations -Mutuals

In alignment with the GRF Planning Committee project purpose, we have categorized each PSC according to these GRF purposes as described below:

1. Amenity Enhancement
2. Asset Enhancement
3. Asset Preservation
4. Asset Replacement
5. Regulatory Compliance
6. Safety

On the following pages we present our research and recommendations.

Highly Recommended

Projects in the Highly Recommended section were selected by the Ad Hoc Technology Committee for one or more of the following reasons:

- Near-term deadlines must be met to maximise benefits or cost savings (Solar Systems, Comcast Alternatives, On Demand Transportation)
- The project has a positive economic return from inception (Solar Systems)
- The cost to savings ratio demonstrates an ongoing savings, year over year after initial investment. (Drone Technology, LED Street Lighting)
- Are required to be implemented prior to other highly recommended projects (Fiber Optic Cable Replacement)
- Improves safety of infrastructure or personnel (Drone Technology, Gateway Data Site Relocation, LED Street Lighting)

Some of these projects, such as the LED Street Lighting and the Solar Systems projects have rebate programs that are slated to expire or reduce benefits in 2019 or sooner. Implementing sooner rather than later increases the economic return of the projects. Others, such as Drone Technology are low cost and easily implementable in a near time frame but have significant benefits.

Conversely projects such as the Fiber Optic Cable Replacement and Mirrored Data Site Relocation are not particularly time critical. However, they become compulsory if any more of the old glass fibres were to fail. Consequently, of high importance.

These projects have been listed in alphabetical order:

Drone Technology
Fiber Optic Cable Replacement
Gateway Data Site Relocation
LED Street Lighting
On Demand Transportation Trial Project
Solar System Common Areas
TV/Internet Provider Alternatives

The Project Selection Criteria Forms below provide detailed information regarding each of the seven highly recommended projects.

Drone Technology	Sponsor	Vicki Swisher	Purpose	Asset Enhancement
Description	Over the past few years, commercial industry has recognized the benefits of using drones for aerial photography. Applications range from geographic mapping to damage assessment. The most significant benefits of using drones are their ability to easily photograph areas with limited access, to provide a birds-eye-view of the terrain below, and to be operated by one individual from the ground. Drones are another tool that can be used by GRF to improve preventive maintenance, landscape management, architectural planning, traffic management, weed abatement, and work coordination. The photographic documentation can easily be shared electronically between GRF staff and vendors to better coordinate work efforts. Current drone technology easily supports potential GRF usage. For GRF purposes, a medium sized drone with photo and video capabilities is ideal. There are numerous drone manufacturers available.			
Criteria				
Costs Implementing And Operating	• Initial investment requires purchasing one drone, obtaining Remote Pilot Certificate, and purchasing drone liability insurance. • Operating costs require yearly liability insurance. There are no maintenance costs. Initial Investment $3750 Operating Costs per Year $500			
Savings	• Reduced man-hours required to evaluate infrastructure issues since there is no need for ladders and scaffolding. • Improved preparation for work activities by being able to visualize the work site and identify the correct tools and replacement parts. • Reduced risk to personnel. • Better method of identifying adequate irrigation, soil erosion, weed abatement, and other potential land management hazards by using high quality electronic photographic and video documentation. • Ability to evaluate wildlife that may be negatively affecting the golf courses.			

	• Ability for Security to evaluate parking problems and traffic flow issues in locations where security cameras are not available. • Enhanced damage assessment following disaster incident. • Improved preventive maintenance inspections should reduce long term maintenance budget. • Assistance in planning future building and landscape development. • Estimate of savings based on 10 man-hours per week at $75/hour. Likely higher man-hours will be realized. Savings per Year $39,000 Will not reduce staff, just permit staff to be re-directed to other tasks.
# of People Served	All GRF members and staff are served by improving GRF preventive maintenance program.
Benefits	May reduce GRF coupon by lowering maintenance costs. Improves GRF personnel safety and disaster assessment.
Risks	If GRF flies the drone close to any manors, noise, privacy, and safety concerns must be considered.
Impact of Timing	This technology can be implemented within 30 - 120 days of purchasing a drone.
Dependency on Infrastructure	• Requires a Remote Pilot License for commercial use. • Needs a secure storage location when not in use.
Project Dependency	None
Recommendation	GRF should purchase one or more drones to support preventive maintenance, landscape management, architectural planning, traffic management, and disaster assessment.

Fiber Optic Cable Replacement	Sponsor	Fred Kern	Purpose	Asset Replacement
Description	Currently GRF has an interconnected fiber optic cable network linking the major common facilities and the front gate guard facility building. It also has a fiber link to the John Muir medical center that has been abandoned. The hub for interconnection is at Gateway. The highest capacity link is between Gateway and the MOD building. The existing system is approximately 21 years old. It has reached its maximum capacity and it is starting to become very difficult to find replacement parts. Some cable strands have failed, further reducing capacity. Replacing existing fiber cable with significantly faster and more reliable cable is necessary.			
Criteria				
Costs Implementing And Operating	Cost of replacing the fiber optic cable network includes the following: 1. Clearing and conditioning the existing conduit system, with some allowance for damaged conduits. A minimum price estimate is $75,000. 2. Installing and interconnecting new fiber between Gateway and MOD, then other GRF buildings, for a minimum price estimate of $95,000. 3. Total project cost is estimated between $170,000 and $225,000.			
Savings	Direct savings are minimal. Some savings will be incurred from the use of more reliable and modern transmission and receiving gear. The replacement should serve the community needs for 25 years of more.			
# of People Served	The Fiber backbone serves all of the GRF facilities today and will do so tomorrow.			
Benefits	Reduces day-to-day failures.			
Risks	• Risk in the installation phase caused by disturbing existing cables in old conduits. • Enough cable strands fail without replacement to lower capacity below requirements; especially important if more data transported over the next 5 years.			

Impact of Timing	Another fiber strand failure will move the project to critical. Implementation in 1 - 2 years to avoid data transfer issues.
Dependency on Infrastructure	Significant dependency on ability to pull new fiber cable through existing conduits without damage.
Project Dependency	None.
Recommendation	The Committee recommends GRF replace existing Fiber cable with significantly faster and more reliable cable in the next 1 - 2 years. This project is currently in the GRF capital improvement long-range plan.

Gateway Data Site Relocation	Sponsor	Fred Kern	Purpose	Asset Enhancement
Description	This is a core infrastructure project that has a goal of improving the reliability and safety of the Rossmoor IT and telephone systems during periods of power outages and high temperatures. Currently, there are two mirrored sites to provide redundancy for all telephone and data used by MOD. These are located at MOD and Gateway. The MOD office location has been upgraded over time to include robust AC systems for cooling and better battery backup (UPS). A power generator of sufficient capacity to power the computer room, telephone systems and a dedicated AC system is to be installed in the near future. The Gateway location has a UPS battery backup, but does not have a dedicated AC system or a generator. A small portable AC generator has been installed as an interim solution. There is no space for a generator to be installed at the Gateway site. Plans are being made to relocate the Gateway site to Creekside where there is room for a generator and it already has a much superior AC system. This relocation is dependent on the Fiber Optic cable upgrade project.			
Criteria				

Costs Implementing And Operating	Total installation and relocation costs for UPS at Creekside are estimated to be in the range of $35,000. Ongoing operating costs are minor, mostly associated with the periodic testing of the generator.
Savings	Minor savings from the switches and data banks operating in a cooler environment, thus decreasing the possibility of failure.
# of People Served	All GRF Members and staff.
Benefits	Significant in situations of power outages and high temperature events
Risks	Very few risks as the Gateway site will remain operational until the Creekside site has been installed and tested.
Impact of Timing	Not too dependent on timing. Would be beneficial to install before the summer of 2019.
Dependency on Infrastructure	The Creekside relocation is absolutely dependent on completion of the Fiber Optic Cable upgrade project.
Project Dependency	Same as above.
Recommendation	This project is of modest cost and high importance, therefore the Committee recommends GRF relocate the data mirrored site upon the completion of the Fiber Optic project. We recommend both projects be completed before the summer of 2019.

LED Street Lighting	Sponsor	Vicki Swisher	Purpose	Asset Replacement
Description	All of the current street lights in Rossmoor are 70-watt high pressure sodium lights. They are located on all of the public thoroughfares in the valley, as well as some cul-de-sacs. GRF Maintenance has indicated that there are a total of 434 street light fixtures. LEDs are the most energy-efficient lighting option on the market today. They can last 2 - 3 times as long as ordinary sodium-vapor street lights and their prices have			

	consistently dropped due to heavy competition among manufacturers. Based on today's LED lighting technology and the lower LED wattage requirements for the same lumen output, GRF has an opportunity to make a significant decrease in yearly lighting costs by retrofitting the GRF street lights with LED bulbs. Discussions are currently in progress with PG&E and outside vendors to provide and install the LED street lights.
Criteria	
Costs Implementing And Operating	• PG&E Turnkey Program will provide LED street light installation for 263 Cobra Heads (no. of lights identified by PG&E; this number varies from the 283 identified by MOD) based on an On-Bill Finance program. This means the cost of materials and installation are paid off by the energy savings. No out-of-pocket costs. Payback is in approximately 8 years (based on initial estimate from PG&E; future years savings will grow with expected increase in electricity and labor costs.). After a maximum of 8 years, energy bill is reduced to actual usage. Initial Investment $0.00 Operating Costs per Year Same as current costs for 8 years • LED street light installation for the 140 Top Hats and Drop Globes can be installed by an independent contractor on a PG&E On-Bill Finance program. This means the cost of materials and installation are paid off by the energy savings. No out-of-pocket costs. Payback is in approximately 5 years. After 5 years, energy bill is reduced to actual usage. Initial Investment $0.00 Operating Costs per Year Same as current costs for 5 years
Savings	• Work can be performed by in-house GRF maintenance personnel to save labor costs but would require approximately 1 - 2 years to complete. This is because staff time is limited. • PG&E can complete the work on the Cobra Heads early in 2019 if PG&E contract is signed by end of 2018. Savings per Year $12,000 after 8-year payoff • Independent contractor can complete the work on the Top Hats and Drop Globes in 2019. Savings per Year $7,000 after 5-year payoff

# of People Served	All GRF members are served by upgrading LED street lights.
Benefits	May reduce GRF coupon by lowering energy costs.
Risks	• No risk for not implementing LED street lights. • No risk to infrastructure if LED lights are implemented.
Impact of Timing	• If contract with PG&E isn't signed by GRF by the end of 2018, the PG&E Turnkey Program and level of On-Bill Financing may not be available. • If contract with PG&E or other contractors isn't signed by the end of 2018, material costs will likely increase by 10 – 20% due to increase in tariffs.
Dependency on Infrastructure	None
Project Dependency	GRF is trying to combine the Top Hat and Drop Globe LED upgrades with other PG&E efficiency upgrade programs for HVAC, interior LED lights, etc.
Recommendation	GRF should evaluate the proposals listed below and continue their discussions with PG&E, Century Lighting, and Enovity to determine the best OBF Turnkey Program. GRF's final determination and contract signoff should be in 2018 to obtain the best prices and installation schedule for 2019. • PGE Turnkey Streetlight proposal for replacement of the Cobra heads • Century Lighting proposal for all street lights • Enovity who offers a comprehensive turnkey energy upgrade program* * Following a presentation by Jeff Matheson at the Dec. 6, 2018 GRF Board meeting, the GRF Board authorized the CEO to execute a Memorandum of Agreement with Enovity to evaluate, design, and complete energy efficient upgrades to GRF property utilizing the 0% interest On Bill Financing Program. This Agreement includes LED street lighting.

On Demand Transportation Trial	Sponsor	David Vereeke Heinz Weihrich	Purpose	Amenity Enhancement Asset Replacement

Description	Uber and Lyft have both introduced custom ride sharing programs for private use by companies and organizations. The Livermore Valley Transportation Authority (LAVTA) implemented a 2-year trial of the programs funded by a grant from the Bay Area Air Quality Management District (AQMD) with the goal of reducing parking at the Bart stations and eliminating low-ridership bus lines within the district. Their program provides subsidized Uber/Lyft rides to users within the geographic bounds of the district. The program has been so successful they intend to self-fund it next year. GRF could seek a similar grant to operate a 2 year trial of these programs for its residents.
Criteria	
Costs Implementing And Operating	Implementation involves minor customization of existing software that would be provided by Uber and/or Lyft. Costs would be covered by the grant. Each shared ride would have a flat rate subsidy that is paid for through the grant. The amount of the subsidy can be determined by GRF. The management of the grant is expected to involve minor bookkeeping entries involving payments of monthly consolidated bills from Uber and Lyft. GRF management costs could be allocated to the grant. A third party provides support for seniors who do not use smartphones or computers for use of Uber and Lyft services. No GRF involvement required.
Savings	The trial will determine if there are any savings accrued by this project.
# of People Served	All residents that are physically able to travel in a passenger car would be eligible for the program.
Benefits	1. GRF may be able to eliminate early morning and late evening on-demand bus services if the residents use the program. 2. Residents may decide to abandon a second car if they value the program.

	3. This program provides an opportunity to encourage residents to try on-demand services that will eventually be replaced by autonomous cars.
Risks	Minimal risks. The grant would cover GRF costs and Lyft & Uber both carry significant insurance policies.
Impact of Timing	Availability to obtain a grant is time sensitive.
Dependency on Infrastructure	None.
Project Dependency	GRF must be able to secure a grant for this project.
Recommendation	Seek a grant similar to LVTA's to operate a 2-year trial of this program for its residents.

Solar Systems for Common Areas	Sponsor	Brad Waite Fred Kern	Purpose	Asset Enhancing
Description	This project proposes installing a second solar field to offset additional power usage in Rossmoor GRF designated meters. Since the original Hill project was approved in 2015, PG&E has changed and relaxed some of the restrictions on Solar fields. The one megawatt limit has been removed. Much of this has to do with the fact that California needs 226% more energy than it produces. State legislators are aggressively supporting Solar and other renewable power sources. With global warming and energy production becoming more and more mainstream in the country and the world, the project is not only economically desirable, it is good for the community and the planet. This project is highly attractive from an economic position. Depending on how the project is financed and its size, it can be cash flow positive from day one with no risk to GRF. Projected savings range from $1.3 to 8 million over 25 years. It is acknowledged that having panels within residents sight is a sensitive issue. That is one of the reasons that the original project was installed "on the Hill" and was largely out of sight			

	to virtually all residents. Fortunately, there is still considerable open space on the Hill that is hidden from view. In addition there are numerous parking lot locations that are available if they were to get a green light from residents. Factors to consider are that a 30% tax credit applies through 2019, but is slated to drop to a 26% credit starting in 2020. This will potentially reduce the savings calculations
Criteria	
Costs Implementing And Operating	The implementation costs will vary significantly depending on the size of the field or fields and their location/s. A rough estimate is that the installed cost would range from 1.3 – 1.7 million. However, the options of financing using either a Lease or PPA reduces the out of pocket costs to zero while having a positive cash savings from day one.

Savings	Implementation savings, just like costs, are dependent on the size of the field or fields to be installed and on the installation location. A just completed analysis by PG&E on the past 12 months is that GRF meters consumed about 3,506,000 kwh. The projection for the Hill solar field is about 2,000,000 kwh. That leaves another 1,500,000 kwh that GRF can offset against their PG&E bills.
	
	The following calculations are an example based on installing a field of approximately 725,000 kwh per year. (This is from a model using the Gateway parking lot.)
	
	• The installed purchase price of the system, if GRF were to buy it outright, is currently estimated at $1.3 million.
	• Assuming GRF has no tax advantages, the payback period would be 9.6 years, and 25-year cumulative savings would be just over $4 million.
	• However, GRF may choose to finance the system by using either Lease approach or a PPA (power purchase agreement). The main advantages of using either of these methods, are:
	  ○ Cash flow positive from Day 1.
	  ○ No out of pocket costs, other than paying a below-market rate for all the electricity the system produces.
	• For the Lease approach on a 7 year payback, the **net** savings over a 25 year period would be in the range of $2.7 million.
	• For the PPA approach the estimated **net** savings over the 25-year term would be $1.3 million.
	• Both of the financing approaches take advantage of the 30% Solar Tax credit.

	If the calculations were extended to cover the remaining available offsets, the 25 year savings would grow to: (Based on offsetting 80% of remaining power usage) • Purchase $6.6 Million • Lease Back $4.5 Million • PPA $2.2 Million
# of People Served	This a GRF wide infrastructure project which will yield long term and permanent savings to all residents.
Benefits	• This project saves money! (80% of the 1,500,000 kwh currently billed to GRF can be offset) • It is good for the environment. • It is good for Rossmoor.
Risks	There is some risk that PG&E will end the rebate programs. Not considered to be significant at this time. Both installation and financing are well proven and considered low risk.
Impact of Timing	The current 30% tax credit is due to drop to 26% at the end of 2019.
Infrastructure Dependency	Few dependencies other than locating a suitable site for the solar field.
Project Dependency	Dependent on financing, permitting and construction.
Recommendation	Initiate finance negotiations as soon as practical to take advantage of the 30% tax credit The GRF Board should reserve funds for an in-depth analysis by a reputable Solar installation firm whose objectives would be: • Calculate the remaining power generation offsets available from the GRF meters. • Research physical location/locations for installing an appropriately sized field that is acceptable to Rossmoor residents. • Estimate the total cost of the installed field. • Establish a small “Solar Research Committee” to work closely with the vendor/s

TV/Internet Provider Alternatives	Sponsor	Bob Kelso	Purpose	Amenity Enhancement
Description	The current Comcast contract expires at the end of 2021. Any new contract should improve upon what Comcast currently offers at a comparable or lower price. This might be a competitor that would offer the same services as Comcast or it might include GRF installing fiber throughout Rossmoor and hiring a management firm to manage the system. In this case GRF would contract with various companies to supply content. There are several content delivery models that should be evaluated.			
Criteria				
Costs Implementing And Operating	Comcast's contract is $4,400,000 a year, about $55/month/manor. This includes TV content, some equipment and 150 mbps internet service. A survey of residents should be conducted within 12 months to assess the desires of the community and their view of possible alternatives. Model 1 would be to retain Comcast with existing package and some improvements, e.g., better Wi-Fi in community buildings, faster Wi-Fi in manors, etc. at a lower cost. Model 2 with Comcast remaining but removing the TV content package allowing residents to manage their own program content. Model 3 with GRF installed fiber and an internet-based content delivery model- Some preliminary research indicates comparable internet could be supplied over GRF owned fiber for about $2.25- 3.00/month/manor. Content delivery (TV programming) is moving towards an over the internet model- Netflix, Hulu, Prime, HBO Go, etc. Most cost about $10 a month. It is possible residents would prefer an ala carte option and spend the remaining money on their chosen programming. Equipment would be a modem and possibly a router in each manor. A management company would be hired to manage the fiber network and resident equipment. Model 4 with GRF installed fiber and a company supplying content, management, etc. This could be Comcast or Wave or another company. Model 5 with a competitor installing their infrastructure in return for a long-term contract.			

Savings	Depends on the model chosen. For residents who don't want any TV programming, Models 2 & 3 could save over $30/month/manor.
# of People Served	All GRF members.
Benefits	Models 3 and 4 give GRF complete control over the delivery of content and vendor. Models 2, 4 and 5 could possibly provide savings over a new Comcast contract modeled after the existing one. Some models would give residents choice in the content they are paying for. Most models would result in better Wi-Fi coverage throughout Rossmoor.
Risks	Comcast is the largest cable provider and has a large support team. Other models might result in poorer customer service. Comcast also owns content, e.g., Comcast Sports Network which broadcasts local sports. That could be problematic in acquiring with another vendor. For residents who want to duplicate what they have now, costs might be higher.
Impact of Timing	Timing is fixed. It will take many months to research alternatives. If the project isn't started in time GRF will not know what alternatives exist at what cost. If nothing else the research will give the GRF negotiators leverage with Comcast. Therefore, research must be started by 2020 since Comcast contract expires in 2021.
Dependency on Infrastructure	Several models would require GRF install a fiber network in Rossmoor. Some models would require enough lead time for a company other than Comcast to install the network since Comcast owns its network.
Project Dependency	None.
Recommendation	GRF should organize a committee in early 2020 to identify alternatives to Comcast, and analyze the costs and benefits of these alternatives versus a new Comcast contract.

Section Summary Highly Recommended Projects

We highly recommend the adoption of the following seven projects:

Drone Technology: The Committee recommends the purchase one drone to support preventive maintenance, landscape management, architectural planning, traffic management, and disaster assessment. Initial investment of $3,750.00 includes the cost of obtaining a remote pilots license and liability insurance. Annual operating costs are estimated to be $500.

Fiber Optic Cable Replacement: The Committee recommends GRF replace existing fiber cable with significantly faster and more reliable cable in early 2019. This project is currently in the GRF long-range plan with an estimated cost of between $170,000 to $225,000. Funds have been earmarked in the 2019 Long Range Trust Estate plan for this project, if the Board chooses to recommend implementation.

Gateway Data Site Relocation: This project is of modest cost and high importance, therefore the Committee recommends GRF relocate the data mirrored site upon the completion of the Fiber Optic project, at an estimated cost of $35,000.00 We recommend both projects be completed before the summer of 2019.

LED Street Lighting: The Committee recommends continuing vendor discussions to find the best OBF Turnkey Program, with installation scheduled for 2019. Vendor programs are turn-key in that savings in electric bills will offset investment. No out of pocket costs.

On Demand Transportation Trial: Designate staff support to seek a grant from the Bay Area Air Quality Management District (AQMD) to implement a 2-year trial of a customized Uber/Lyft style transportation program. The Committee recommends a Summer 2019 date for grant submittal.

Solar Systems for Common Areas: The Committee recommends the GRF Board select a solar installation firm to calculate the remaining power generation offsets available from the GRF meters. The firm will also research physical location/locations for installing an appropriately sized field that is acceptable to Rossmoor residents and estimate the total cost of the installed field. The committee further recommends the establishment of a small “Solar Research Committee” to work closely with the vendor/s.

TV/Internet Providers: The Committee recommends GRF organize a committee in January 2020 comprised of staff and residents to identify alternatives to Comcast, and analyze the costs and benefits of these alternatives versus a new Comcast contract.

Recommended

Projects in the Recommended section were selected by the Ad Hoc Technology Committee for one or more of the following reasons:

- Improve GRF system efficiencies thereby saving time and/or money. (Document Scanning, Irrigation Watering Technology, Business Intelligence Decision Support)
- Demonstrates long term focus on renewable energy sources (Autonomous Vehicle Developments)
- Moving to a resident services centered approach to current Rossmoor amenities (Wi-Fi Coverage – Common Spaces, Event Management and Room Reservations)

Some of these projects, such as Document Scanning and Irrigation Technology, build on current GRF practices. Others, such as Autonomous Vehicles and Event Management and Room Reservations, offer windows into the future world of transportation and IT.

Autonomous Vehicle Developments
Business Intelligence Decision Support Software
Document Scanning Phase 2
Event Management and Room Reservations
Irrigation Watering Technology
Wi-Fi Coverage – Common Spaces

Autonomous Vehicle Developments (AV)	Sponsor	Weihrich Vereeke	Purpose	Establish Relationships with Key Players in AV Development
Description	The goal of this project has been to scan Autonomous Vehicle (car and bus) developments for grant application opportunities at Rossmoor. AV projects are in their infancy, but evolving rapidly. Contacts have been made with: ● Contra Costa Transportation Authority (CCTA) ● Livermore Valley Transit Authority (LVTA) ● Amber (Dutch autonomous car sharing) ● GIG (AAA car sharing) ● Baidu (autonomous busses) ● EasyMile (autonomous busses) The Redefining Mobility Summit Conference at Bishop Ranch held in the Spring of 2018 was the source of many of the above			

	contacts. A committee consisting of residents and staff will continue to monitor the above contacts in addition to scanning the literature for new AV application opportunities at Rossmoor providing the board expresses its commitment to participating in autonomous vehicle trials.
Criteria	
Costs Implementing And Operating	Still in the information gathering stage. Some funds should be set aside to cover costs of attending annual transportation conference. Estimate of costs for 2020 is $500/person
Savings	Not Applicable - Still in the information gathering stage.
# of People Served	Most Rossmoor residents would be served by AV developments.
Benefits	Increased mobility and safety for the community.
Risks	Not Applicable - Still in the information gathering stage.
Impact of Timing	Depending on future developments, but opportunity could be lost if we wait too long. Various grants are still being awarded.
Dependency on Infrastructure	EV charging stations and transportation management will be crucial for most new applications.
Project Dependency	None
Recommendation	Develop a subcommittee of staff and residents in 2019 to monitor grant opportunities and attend future conferences.

Business Intelligence Decision Support	Sponsor	Chris Slee	Purpose	Operational Efficiency and Effectiveness
Description	Modern systems today often come with built in Decision Support System (DSS) tools that significantly enhance management's ability to analyze trends and results. Today, critical management data are often presented in a Dashboard format that is easy to view and interpret. The ability to present a number of key factors for different areas in a single screen certainly aids management's ability to track trends at an early date. Currently Rossmoor's Jenark system uses an aftermarket DSS called "Crystal Reports" to generate a variety of management reports. This software has recently been upgraded to the "Server" version which can produce Dashboard level analysis.			

	We recommend that staff and management undertake a pilot project to produce Dashboard reporting on a variety of key factors. This Project recommends that management pay special attention to the ability of any upgrade or adoption of a new software system (core or non-core) to be able to feed data to a DSS software package via an open API (Applications Program Interface).
Criteria	
Costs Implementing And Operating	Implementation: Typical package 1-2 months of technical work + collaboration with financial analyst Ongoing improvements over time Operating: $3,000/year approx
Savings	Potentially significant. GRF and the Mutuals currently have little in the way of performance metrics for detailed cost accounting or quality indicators making it difficult to estimate savings. “You can’t manage what you don’t measure” as the management saying goes.
# of People Served	Directly: Boards, Mutuals and Senior Staff Indirectly: 1,000s of residents who get better insight into how Rossmoor is managed, providing better confidence.
Benefits	Soft: Better confidence that Rossmoor is being effectively and efficiently managed. Benchmarks for Dashboards: See Tahoe-Donner examples, typical work order management and others in the supporting Project Definition. [Even Churchill used dashboards in the War Rooms to manage WWII efforts]
Risks	Nothing obvious
Impact of Timing	Sooner the better to get information and insights into current performance
Dependency on Infrastructure	Unix type server and data space
Project Dependency	Web Competent Technical: Someone with basic Technical Expertise Management and Analyst that understand what this can do. Willingness to investigate KPIs
Recommendation	Assign a member of staff to develop a presentation for all departments that could benefit from dashboard summaries of department data. Feedback from such a presentation will help determine the demand for such a software tool.

Document Scanning and Online Retrieval – Phase 2	Sponsor	Vicki Swisher	Purpose	Asset Replacement
Description	The previous document storage and retrieval system was completely offline, manual, and paper-based. Personnel needing historical documents were required to retrieve then from storage boxes and file cabinets. Realizing the limitations and antiquated methods of historical document access, a new electronic document scanning and online retrieval system was implemented in 2017 - 2018 for the Alterations and Work Order System Departments at a cost of $97,000. The current system has proven effective for retrieving historical documents and scanning all new documents into the system. The Square 9 document management software introduced in Phase 1 included the following features: Electronic filing cabinets that provide a framework for organizing all digital and paper documents. Works in tandem with scanners, which convert paper documents into digital versions. Provides sophisticated search engines to allow quick access to any document or file. Enables varying levels of document security. Can be accessible from various devices (e.g. PC, tablet, smart phone). When the previous budget was exhausted, many historical documents still required scanning due to the much greater volume than was initially estimated. Scanning the remainder of the Alterations and Work Order System historical paper documents are unlikely to be completed in a timely fashion with in-house MOD/GRF personnel. However, MOD agrees that this work is not the responsibility of GRF and should not be included in Phase 2.				
Criteria				
Costs Implementing And Operating	System growth is not an issue because 250 Square 9 licenses were originally purchased at a yearly cost of $4249. New hardware optional since in-house scanning typically can be performed on existing equipment. New personnel receive 1 ½ hours of training. Cost estimate based on 25 personnel at $65/hour. Phase 2 initial investment based on approximately the same volume of historical document scanning that was performed by an outside vendor in initial phase of implementation. The current contract with Square 9 includes maintenance support. The yearly cost of the maintenance contract is part of the licensing fee.			

	Initial Phase 2 Investment $75,000 for outside contract labor and training costs Operating Costs per Year $4,249 for Square 9 licensing fees; same cost whether Phase 2 is implemented or not.
Savings	Reduced man-hours required to retrieve historical documentation. Estimate 1000 man-hours per year at $65/hour. Elimination of storage requirements. This would make space available at for other uses at Public Safety, Human Resources, and Recreation Department offices. Permit staff to be re-directed to other tasks.
# of People Served	All members of GRF are served by continuing to upgrade the MOD/GRF document storage and retrieval capabilities.
Benefits	May reduce GRF coupon by lowering administrative costs.
Risks	There may be a significant volume of historical Public Safety, Human Resources, and Recreation Departments documents left to scan by in-house MOD/GRF personnel after completion of Phase 2. Past experience has indicated that it is difficult to accurately estimate the volume of historical documents because they are stored in multiple locations.
Impact of Timing	This system upgrade can be completed within 6 months of selecting an outside vendor to scan documents.
Dependency on Infrastructure	Requires GRF IT to maintain system server housing software. This is already required to support the Alterations and Work Order scanning performed in Phase 1 Requires MOD/GRF to continue to maintain copiers with scanning capabilities in Public Safety, Human Resources, and Recreation Department offices.
Project Dependency	None
Recommendation	Continue with Document Scanning Project. Move to Phase 2 to provide document scanning and online retrieval to Public Safety, Human Resources, and Recreation Departments at an initial investment of $75,000 in contractor and personnel training costs. There is no additional licensing fee for Phase 2.

Event Management and Room Reservations	Sponsor	Chris Slee, Bob Kelso	Purpose	Amenity Enhancements
Description	Current stand-alone software packages exist to provide a secure resident portal supporting a full complement of event management services such as live calendars, room reservation/setup, event ticketing with check-in, reminders, and online payments. These packages are relatively inexpensive and easily installed and maintained. Thundertix and jEvents are two such projects and would appear as a link from Rossmoor.com to the Event Management and Reservation Services. If GRF decides to do an in-house review in 2019 of all software/ core systems solutions event management software packages can be evaluated against the option of upgrading the current Activenet software.			
Criteria				
Costs Implementing And Operating	Implement: Software: less than $2,000/yr. for unlimited sites for ALL related software, that is Event Management, Modern Web Infrastructure, Smart News, Electronic Funds etc. jEvents is $94/year for Gold Club, for all available features, integrations and Unlimited sites[1]. Note the "Off-The-Shelf" software sold and delivered over the internet, open source and adaptable NOT closed software held [and hidden] by a service provider. $2,000 is a generous overstatement/total with a 100% contingency in case future ideas require additional plug-ins not yet envisioned. Labor: Depends on scope of sites, events, etc. I.e. GRF events, recreation department, Mutuals, Clubs etc. Site[s] for all GRF and recreation departments could easily be implemented in less a month. Operating: Software: < $2,000/yr. for unlimited sites with multiple independent calendars, and multiple categories of events [Once again, this is ALL related software] Labor: ongoing posting of events etc.			

[1] https://www.jevents.net/join-club-jevents

Savings	There are lots of manual costs around every event as an event is planned, published out through news and newsletters, resources such as rooms are planned and reserved, payments made, reminders are sent including agendas and minutes, ticketing, payments (again) and reports are published and posted after the event. Replace Activenet so remove these costs while providing superior functionality
# of People Served	1,000s of residents, perhaps 100,000s of transactions For example: a user can easily look at all upcoming events, by facility. i.e. all movies scheduled at the Peacock theater. Or all musical events no matter where they are held. With the addition of Smart News, users could subscribe to an event mailing list that provides a weekly summary of all upcoming musical events + all upcoming movies. Note: "movies" and "musical" are simply examples of categories of events. This could equally be "Tours", Board meetings, all GRF events depending on the categories chosen.
Benefits	Instant visibility to all events, categorized, online registration, ticketing etc. Accurate event calendars with notifications, feeds etc. to "Smart News" Example: see Rossmoor Tennis Calendar at https://rossmoortennis.com/our-calendar.html. This uses only one calendar, but multiple categories the different teams, tournaments, coaching clinics etc.
Risks	Staff and / or residents are slow to adopt or find the technology hard. A significant number of Rossmoorians will continue to use travel and paper solutions **Update**: the staff chosen solution may prove inadequate and need to be replaced
Impact of Timing	Sooner the better to simplify processes
Dependency on Infrastructure	Web server
Project Dependency	Modern Online Infrastructure using a Content Management system [CMS] and plug-ins. Web Competent Technical: Someone with basic Technical Expertise Probable interface: AcyMailing for Smart News and Newsletters **Update**: Staff has been exploring solutions to replace Activenet using an event management service in conjunction with an open CMS. They have prototyped a solution using "Thundertix" as a framed plugin to a CMS [WordPress]. This enables room reservation, online ticketing, as well as back office support for walk in customers. Other features include barcode tickets to

	check in at event. Staff is also looking into single sign-on for this and other projects. Staff projects that this will fully replace Activenet, at a lower cost, with much better, more complete functionality. This solution also has interfaces and APIs that would allow integration with the proposed Data41 “central database”
Recommendation	Implement the staff trial of Thundertix, then monitor, learn and decide if this is an adequate longer term solution. Revisit if required in 2019/2020.

Irrigation Watering Technology	Sponsor	Vicki Swisher	Purpose	Asset Enhancement
Description	Over the past decade numerous upgrades have been made to the irrigation systems installed on the GRF landscaped property and golf courses. Most of these upgrades were in response to a mandate by EBMUD to reduce water usage during the 2012-2016 drought. Because of these upgrades, GRF significantly improved the efficiency of their irrigation program. Further reduction in irrigation water usage is achievable due to continuously improving irrigation technology and the opportunity to complete the water reduction initiatives started during the drought and are items in the GRF General Plan. (See Irrigation Watering Technology TPD for an extensive narrative explaining current irrigation practices and potential future upgrades.) To achieve the maximum reduction in irrigation water usage and realize all of the benefits, both GRF Landscape Property Management and Golf Course Management need support from GRF to continue upgrading and maintaining their irrigation systems. • Golf Course Management – Course Management is currently “fine tuning” their irrigation system by adjusting and/or upgrading MP rotator nozzles, removing unnecessary lawns, and installing more drip irrigation. They are able to perform this work within their typical yearly budget. The GRF long term maintenance replacement budget currently specifies replacement of the irrigation pump and re-surfacing the gunite that seals the			

	bottom of the lake. This work needs to be supported and budgeted in order to ensure efficient water usage. • GRF Landscape Management – To achieve the maximum reduction in irrigation water usage and realize all of the benefits, it is recommended that a 5-year plan be developed and funded to complete the water reduction initiatives started during the previous drought. Starting in 2019, recommend using a portion of the GRF landscape property maintenance budget to start the changeover of sprinklers to drip irrigation. The yearly cost savings from this improvement can be folded into the subsequent year's budget. Therefore, some of the costs associated with future irrigation upgrades are being funded through savings realized from previous improvements. In addition, GRF should support the installation of electronic soil moisture monitors in strategic areas on the property to gauge watering efficiency. – In particular, GRF Landscape Property Management has indicated a benefit in removing the lawn on the 5 sections of median on Rossmoor Parkway and replacing it with drought resistant plants and state-of-the-art drip irrigation technology similar to the project completed at the entrance to Rossmoor. A 5-year timeline is being proposed for this landscape replacement project.
Criteria	
Costs Implementing And Operating	• 1 ½ sections of median on Rossmoor Parkway were replaced in 2018 at a cost of $30,000 using GRF landscape maintenance labor. The estimated cost if using outside contract labor was $50,000. • EBMUD provides rebates for removal of lawns. This will help offset the replacement costs. • Current operating costs for water is $2,600/year per section. • Water required for drought resistant plants using state-of-the-art drip irrigation is 1/2 the water required for a lawn. • Current operating costs for lawn maintenance is $4,800/year per section • Removing lawn substantially decreases landscape maintenance. Median maintenance for drought resistant plants utilizing state-of-the-art drip irrigation is estimated at 25% of current requirements. Initial Investment to replace each of the 5 sections of lawn on Rossmoor Parkway with drought resistant plants and state-of-the-art drip irrigation $40,000 per section using outside contractors minus rebates

	Estimated operating costs for water and lawn maintenance after replacing the lawn with drought resistant plants and state-of-the-art drip irrigation $2,500/year per section
Savings	Estimated Savings per Year Based on 2018 Costs $4,900 per replaced section • 8 years to recoup landscape costs per median section based on current water and maintenance costs. • Estimate 5 years to recoup landscape costs per median section based on anticipated yearly increases in water and maintenance costs.
# of People Served	All residents of Rossmoor are served by upgrading irrigation practices in common GRF property.
Benefits	• Realizing a substantial decrease in water bills while still maintaining beautiful landscaping. • Reducing cost to maintain / replace vegetation effected by poor irrigation and during periods of drought. • Reducing maintenance costs due to failure of old irrigation components. • Eliminating manpower requirements for monitoring changes in irrigation requirements based on weather conditions. • Reducing collateral damage such as soil erosion and wood rot. • Receiving rebates from East Bay Municipal Utility District (EBMUD) for landscaping and irrigation systems that conserve water. • Being a good custodian of our environment
Risks	None
Impact of Timing	The longer the delay in starting the project, the greater potential for loss or a significant reduction of EBMUD rebates
Dependency on Infrastructure	None
Project Dependency	None
Recommendation	• GRF maintain existing long-term yearly golf course landscape budget to adjust and/or upgrade MP rotator nozzles, remove unnecessary lawns, install more drip irrigation, replace the

	irrigation pump and re-surface the gunite that seals the bottom of the lake. • GRF maintain yearly landscape property maintenance budget to start the changeover of sprinklers to state-of-the-art drip irrigation. In addition, the GRF budget should support the installation of electronic soil moisture monitors in strategic areas on the property to gauge watering efficiency. • GRF should add funds to the landscape property maintenance budget over the next 5 years for removing the lawn on the 5 sections of median on Rossmoor Parkway and replacing it with drought resistant plants and state-of-the-art drip irrigation technology similar to the project completed at the entrance to Rossmoor. The recommendation is to replace one section per year at a cost of $40,000 per section. The re-landscaping of any one section of median can be treated as a stand-alone project. Approving the re-landscaping of one section of median does not commit the GRF Board to completing all of the medians. The proposed 5-year plan can be terminated or extended after the completion of each median section, depending on the actual costs, resident reaction, and whether the cost savings per section achieves or exceeds $4,900/year.

Wi-Fi Coverage Common Spaces	Sponsor	Chris Slee	Purpose	Amenity Enhancement
Description	Expand Wi-Fi Coverage to all social gathering spaces in GRF. E.g. Hillside, Pools, Creekside bar*, restaurant*, outside* Bocce ball area, Buckeye courts Beyond personal communications and sharing, Wi-Fi is essential to enable electronic computer interactions and transactions. [e.g. checking people in for an event with electronic tickets] (*) Service should be further improved with mesh networking in GRF problem areas. Mesh networking: [a group of Wi-Fi routers that replace a single router then collaborate together to give better coverage and performance]: Mesh networking could also be deployed by Mutuals where poor wiring obstructs streaming and restricts contracted Comcast internet performance. [Many cannot get anywhere near the Comcast contracted service level of 100Mbps, so cannot stream online content etc.] This would be a mutual cost but perhaps something where GRF could leverage the scale of Rossmoor in a bulk purchase. [at Mutual cost]				

	Also upgrade Comcast service obligations to at least match in-house bandwidth in common areas. Comcast currently provides 175Mbps service to residents, but 50Mbps [or less] to common areas, where there is much more traffic and need for bandwidth.
Criteria	
Costs Implementing And Operating	Cost to Implement: Hardware for network expansion using point-to-point transmitters to connect remote locations that lack wiring: less than $1,000/site installed. Probably 4-5 sites to start Operating costs: Minimal, perhaps occasional troubleshooting Mesh Networking: Less than $400 for 3 hub mesh. E.g. Mesh networking could improve coverage in the Creekside facility More exotic: Microwave point to point can connect where installing cable is too expensive. A system that performs at up to 1000Mbps, for up to 13 kilometers costs $3,000 [2 x $1,500[2] per antenna that is similar to a Dish/DirectTV antenna] . Add installation costs. This is almost certainly cheaper than pulling cable in some areas.
Savings	Without Wi-Fi, groups are trapped in paper based systems. How can some people sign up over the internet while others use paper in a non-Wi-Fi site?
# of People Served	1,000s of residents, lots of events
Benefits	Ubiquitous Wi-Fi coverage has become “table stakes”, a basic expectation of modern society. Support Wi-Fi Calling[3] to overcome cellular dead spots. This enables a cell phone to make calls over Wi-Fi where cell service is poor. It is available on all four major networks for many different cell phones Provide high speed internet where currently not available in Mutuals

[2] https://www.bhphotovideo.com/c/product/1049767-REG/ubiquiti_networks_af_24_airfiber_24ghz.html?ap=y&gclid=CjwKCAjwq57cBRBYEiwAdpx0vYXyCUoXiWYSjCQifYu713uSdzP8QMIZSPEJM_FFv8Yj4wntrqTWYRoCreMQAvD_BwE&smp=y

[3] See https://www.cnet.com/news/what-is-wifi-calling-tmobile-verizon-att-google-fi-sprint-setup-faq/ for a more thorough overview.

Risks	Comcast xFi Pods prove inadequate and need to be replaced. Bad weather can temporarily interrupt service. [Not likely to be a major issue]
Impact of Timing	Sooner the better to simplify processes
Dependency on Infrastructure	none
Project Dependency	none

Recommendation	Recommendations:
	• Expand to underserved sites by using **mesh** networking:
	  ○ Use Comcast xFi Pods if they are compatible with the existing Comcast deployed Wi-Fi routers ($199/6 pack for an area like Creekside]
	  ○ Use commercial mesh routers (e.g. Netgear Orbi, 8,000 SqFt coverage for $500) as a backup
	  ○ Use Wi-Fi heat map apps on a phone and/or PC to inspect performance and fine tune for weak areas
	  ○ Collaborate with Mutuals on bulk purchase agreements where agreed
	• Use Wi-Fi and microwave **point to point** for unserved, distributed areas, [e.g. Hillside, Buckeye, perhaps also MOD]
	  ○ Wi-Fi point to point for normal bandwidth areas
	  ○ Use microwave point to point for high bandwidth areas where economically more effective than installing new cable. [e.g. Hillside complex], then mesh if needed
	• Include in the next internet service agreement [e.g. Comcast]
	  ○ Service to unserved areas
	  ○ Much higher bandwidth to common areas as they currently have lower service levels than manors. [e.g. 200Mbps down, 100Mbps up]

[2]See https://www.cnet.com/news/what-is-wifi-calling-tmobile-verizon-att-google-fi-sprint-setup-faq/ for a more thorough overview.

[3]E.g. Google Fi, Xfinity Mobile, all iPhones since 5c, many Samsung, LG phone**S**

Section Summary Recommended Projects

We believe the following six projects deserve serious consideration:

Autonomous Vehicle Developments: The Committee recommends a task force of staff and residents be formed in 2019 to monitor autonomous vehicle grant opportunities. The committee further recommends a representative from Rossmoor attend any upcoming mobility conferences in the area. Anticipated cost of conference attendance is $500/person/year.

Business Intelligence Decision Support: Assign a member of staff to develop a presentation for all departments that could benefit from dashboard summaries of department data. Feedback from such a presentation will help determine the demand for such a software tool.

Document Scanning and Online Retrieval – Phase 2: In 2019, provide document scanning and online retrieval to Public Safety, Human Resources, and Recreation Departments at an initial investment of $75,000 in outside contractor labor and personnel training costs.

Event Management and Room Reservations: Setup a trial to explore the value and flexibility of the jEvents software using the database of one of the organizations that would expect to benefit from the use of this software.

Irrigation Watering Technology: The Committee recommends removing the lawn on the 5 sections of median on Rossmoor Parkway and replacing it with drought resistant plants and state-of-the-art drip irrigation technology similar to the project completed at the entrance to Rossmoor. The recommendation is to replace one section per year over a period of five years at a cost of $40,000 per section.

Wi-Fi coverage Common Spaces: Expand wi-fi to underserved sites by installing a mesh networking system at Creekside as test site. Initial cost outlay approximately $400 for 3 hub mesh. If satisfied with results, consider other sites that would benefit from a mesh network.

Inevitable Project: Core GRF IT System Upgrade

This portion of the report incorporates the following Committee technology projects:

1. Web-Enabled Member Interaction
2. Database Integration
3. Upgrade Jenark Upgrade & Implement Standard API
4. Community Association Management/Property Management Software
5. Modern Online Infrastructure

These projects represent approaches identified by the Committee to improve GRF operations using Information Technologies (IT) and move toward a more integrated platform.

Background

During the past 20 years there have been many, many changes in the way people and organizations interact with the world and conduct business. Twenty years ago many of us did not have email and none of us had a smart phone. We didn't have Amazon, Skype, Facebook or Google.

Technology and the world have moved forward in a rather dramatic fashion as technologies have matured. Rossmoor has also moved forward, but it has been a module here, a software package there, with periodic upgrades to the existing core property management system.

Today we are witness to a world that has rapidly moved online to provide customers communication, business transactions and direct interaction. Partly this is because low cost, easy to use tools have been developed that greatly simplify many tasks. GRF has the option to make a strategic decision to move forward as well. The Committee is quite aware of the critical importance of choosing the best path forward.

This section outlines fundamental choices for a new GRF strategic direction which embrace operational efficiencies and direct member/resident service through IT.

The Current State of GRF IT

The Jenark Property Management system has been operational in GRF for 20 years, and includes software modules that support accounting, property management, human resources, inventory and a work order module. Jenark (now Corelogic) is lacking in key functionality and data integration with third party applications for access control systems, gate control, golf, and event management. This has necessitated GRF adding six additional application databases to support these functions. None of these are integrated with Jenark. As we move toward an online web based environment greater data integration will become critical.

Imminent Projects

Realizing the complexity involved in an IT strategic plan, the Committee initially researched two specific areas which are both foundational and lay the ground-work for follow-on projects. These foundational initiatives are crucial to the development and implementation of longer-term projects described later in this section. The Committee supports the adoption of the following:

- Web-Enabled Member Interaction
- Data Integration

The results of this research indicated that these, more than any other IT projects, should remain in the forefront of IT projects undertaken by the Board. Below are two Project Selection Criteria forms that provide the details that brought us to this conclusion.

Web Enabled Member Interaction	Sponsor	Mary England	Purpose	Asset Enhancement
Description	Currently the Rossmoor.com website is being updated and modernized to incorporate a more modern look and feel. A critical next step will be to bring the site to an interactive level for residents' access to GRF services. The interactive Rossmoor.com website redesign project will target delivery of real-time, online/mobile connectivity, interactive transactions, and services between GRF and members. Key to the functionality will be a secure logon "Member Portal" to access member, data member communication, and appropriate access to data transactions currently residing in GRF applications and databases.			
Criteria				
Costs Implementing And Operating	Design and development costs are commensurate with the level of interactive functionality. A very basic redesign will be in the range of $50,000. Design and development of an interactive, transactional, functionality-rich site will be in the range above $200,000.			
Savings	Savings will be realized in GRF departments currently operating inefficient delivery of direct-to-member services. Overall redundancy and repetition of services can be reduced with efficient workflow and delivery through the "Member			

	Portal". Operational cost savings can be realized from the reduction in redundant, repetitive tasks.
# of People Served	As younger, more technology-reliant GRF members move in, a higher percentage of members expect to access GRF services, documents, transactions, and communications via a website, mobile apps and mobile devices. By 2020, members will expect a highly-integrated website with interactive content, user-defined functionality, and personalized access to GRF services. Secure "Member Portal" provides online/mobile access to member-only data.
Benefits	Benefits of a website which delivers member access to GRF services 24 X 7 include: 1. Workflow efficiency for GRF employees, members & Mutual beneficiaries 2. GRF/MOD Operations budget savings due to workflow efficiencies 3. Delivery of digital documentation, content, communication which saves travel time, document scanning, lost document search time, etc. 4. Streamlines repetitive, redundant workflow tasks handled in person/by phone 5. Provide potential portal for more secure efficient access to GRF & member data 6. Fewer trips to Gateway and MOD where parking is limited.
Risks	The risks of NOT redesigning and developing a secure Rossmoor.com website are that stand-alone websites like TiceCreekFitness.com may proliferate. In the absence of a new GRF policy for Internet/Web and Data Security, member data may not be secure.
Impact of Timing	Member access to data and level of integration with current GRF operations and GRF applications (6), depend on: 1. GRF operational needs assessment 2. Jenark database integration project
Dependency on Infrastructure	Rossmoor.com website information architecture, content delivery, new functionality, and data integration will need to be based on a secure web platform and member resident portal.

Project Dependency	This project is dependent on integrated and consistent data to be achieved in the "Database Integration" process.
Recommendation	Conduct needs assessment survey on member interest in accessing GRF services through IT (online, mobile devices, etc.). Develop standards, member data privacy testing, and security requirements which all of GRF- interactive services will adopt.

In order to facilitate data clean up, data consistency, and support for the Web-Enabled Member Interaction project, the Committee investigated various aspects of database integration. Specific details are included in the PSC below.

Database Integration	Sponsor	Bob Kelso	Purpose	Asset Enhancement
Description	GRF uses 6 different databases to organize data on members. • Jenark for resident information and accounting • Amanonet for gate control • Activenet for room reservations • Sipass for access control, currently only at the Fitness Center • MindBody for scheduling private lessons at the Fitness Center • Clubsoft for the Golf Shop POS and inventory It would be useful to be able to crosscheck and cross post data in all databases which would save on data entry time and reduce the potential for errors. Additionally staff could query integrated databases for management decision making.			
Criteria				
Costs Implementing And Operating	On 8/30/18 the GRF Board approved a contract with Data41 not to exceed $19,000 to review our databases and come up with a plan and cost to integrate the databases. Data41 completed its review and came back with a proposal to integrate the existing databases. The cost estimate is $37,800 for work by Data41, approximately $8,000 for a server and $9,200 for contingencies for a total of $55,000.			

Savings	There will be labor savings since the same resident data would not need to be added to each database separately.
# of People Served	All residents would benefit from a reduced coupon due to more efficient use of staff.
Benefits	This would greatly simplify resident online access to their activity in Rossmoor. More efficient use of staff time. There would be additional benefits due to data analysis that could help GRF evaluate amenity usage, etc. Fewer data entry errors.
Risks	Some custom software projects become an endless money sink.
Impact of Timing	None beyond normal inflation.
Dependency on Infrastructure	Purchase a server for approximately $8,000.
Project Dependency	Future expansion of access control and developing an online portal for residents probably will be more easily accomplished with either data integration or new CAM software in place. Nothing is needed to be in place before data integration can be started.
Recommendation	Proceed with the Data41 proposal and funding. In 2019 begin a data clean-up effort to the Jenark database since this will be necessary no matter which path is chosen for our online access project. Once the future of Jenark becomes clear, evaluate the potential for a replacement for Jenark, which we discuss below.

<u>Recommendations for Imminent Projects:</u>

- Enable resident portal for member online/mobile interaction with GRF services.
- Develop standards and testing and security requirements for web-enabled services.
- In 2019 begin data clean-up program that promotes integrity and consistency between different systems. This effort will be necessary regardless of which major long term option is selected in the section below.
- Proceed with the Data41 proposal and funding to accomplish the following:
  - Improved integration between existing software systems.

- Support the portal envisaged by both a Web-Enabled Member Interaction and the staff effort to integrate to other systems through the “central database”.
- Provide a data warehouse for later support of a Business Intelligence/Decision Support system.
- These recommendations may be a permanent path to the future or a transitional step to a core IT replacement.

The imminent projects described above jump start our ability to move into a more integrated world. The GRF Board may choose to stop here and not move on to more involved approaches however we present them below for future groups to review.

Major Long-Term Options

What has evolved are three distinct ways to provide additional functionality to resident services applications. These choices have implications for Rossmoor operations in the future. The choices we present are:

- **Option 1 - Upgrade Jenark & Implement Standard API**- Jenark has embarked on an effort to improve their competitive position. Jenark improvements may allow for integrating existing and/or additional applications for gate security, event management, golf, etc. in the next few years.

- **Option 2 - Replace Jenark** - with a different community association/property management program (CAM/PM) that marries property management/ accounting functionality with applications for golf, event management and other resident service needs.

- **Option 3 - Modern Online Infrastructure -** Develop a platform to provide access to online resident services that we largely develop in-house.

None of these options are simple. There are potential operational savings from each option as GRF workflow efficiencies are achieved and members go online.

It is important to note that many other GRF Ad Hoc Technology projects in this report are both interdependent and dependent on the IT option selected above.

Critical Factors for Selecting an Option

Any path to facilitate significant improvements to the IT system will involve:

<u>Clean data</u>

- There are questions as to the reliability of data housed in the Jenark database. A process should be undertaken to test the accuracy and consistency of current data
- .

Open/User Application Program Interface (API)

- An Open API is a set of requirements that govern how one application can communicate and interact with another. It provides developers with programmatic access to a proprietary software application so that two disparate programs can communicate.
- If GRF chooses to have an accounting/property management program and a separate resident services program, it is necessary that they both have open APIs so they can communicate without the need for costly customization.

Data, Application, and Network Security Standards

- Personally-Identified data must be protected for privacy by new GRF data security protocol and policies.
- Access to application(s), websites, and across the GRF-managed network needs to be secured by managing security levels for all users, including GRF staff, third parties, members and residents.
- Member-related GRF communication and business transactions on, through or outside of Rossmoor.com are compliant with new privacy, security protections in new protocols and policies.
- Network, application, and data security standards are reviewed, and updated annually.
- GRF Policy 104.3 is reviewed and revised as needed to ensure that the policy and practices are compliant with “industry standard best practices” and laws.
- Single-sign-on (SSO) login if implementing an online member portal will be authenticated with GRF membership data.

New Resources

- Consider acquiring a software web development professional to evaluate and implement third party systems as well as implement data and network security standards as access to GRF services move online.

Member Interaction

- Member/resident access to GRF services and information delivered online can be achieved with any of the three options presented below.
- The Committee members who evaluated a significant number of other communities (CAM/PM and Member Online Interaction Projects), have reported that online access for members/residents is now a standard and no longer unique.
-

The information provided in the Project Selection Criteria Forms below will illustrate the basis for the Ad Hoc Technology Committee’s recommendations.

Option 1: Upgrade Jenark & Implement Standard API

Jenark Upgrade & Implement Standard API	Sponsor	Mary A. England	Purpose	Asset Enhancement
Description	The Golden Rain Foundation has operated Property Management software, Jenark (now Corelogic) for 20 years. The Jenark system has supported accounting, property management, HR, and inventory and a customized Work Order Module. Up to now, there has been no effort for database integration with other GRF software applications, except for the recent integration of the SiPass system used for entry control at the Tice Creek facility. A GRF Board goal is to evaluate the feasibility and cost effectiveness of data base integration or synchronization for most or all of its separate application databases. Jenark plans to offer a standard Applications Program Interface (API) to allow multi-way interfaces between databases. The ability of Jenark and its owner Corelogic to achieve the development timeline should be carefully monitored. However, evaluating software platforms that offer additional functionality and integrate with Jenark will be of significant value. The option to integrate other Software Vendor platforms with Jenark Accounting and Work Order System Modules may offer a solution to better deliver GRF services and manage GRF member interactions without having to undertake a major system conversion.				
Criteria				
Costs Implementing And Operating	The Jenark upgraded API fee structure, is, in addition to current licensing fees and future cost increases: Integration/communication monthly API fee = $670 per month 1- time Server communication fee = $2500 Maintenance fee of 3 % Two examples of Integration Vendor Platforms Costs are below: 1. FRONTSTEPS CONNECT licensing fees include: FS CONNECT = per unit per month = $0.35 = $2345 FS Set-up fee 1 time = $750 Total Price/ Month 1 = $3095 2. PILERA PREMIUM pricing includes:			

	$0.25 per unit per month = $1675 Set-up fees = $150 per community= $2700 Optional Add-ons: (Accounting Integration, Knowledge base, tickets, vendors) = $0.13 per unit per month = $871 Additional fees for: Websites, Online Forms, SMS, phone
Savings	Cost savings will be realized if workflow of GRF Member/Resident Services is streamlined for effective and efficient delivery of GRF services.
# of People Served	GRF/ MOD employee users, GRF members/residents, Mutual beneficiaries, Mutual Board Directors will benefit by improved access to relevant business transactions, communications, and integration with GRF Jenark accounting, property management, and work-order system.
Benefits	The benefits of a Jenark upgrade are multiple. GRF may be able to: 1. Migrate to Jenark Property Management software and realize benefits of data being able to "push/pull" data with the Jenark database, integrate with other software platforms and other databases via standardized API. 2. Retain the core property management software modules and add functionality with upgraded data access and software platform integration for user benefit. (See example of benefits in the "Jenark Upgrade" Technology Project Description Appendix)
Risks	Corelogic (Jenark) fails to deliver on API standardization and/or development timeline or integration vendor partners do not adopt the Jenark API standard.
Impact of Timing	2020 is the target date for Corelogic availability of a standardized API + Proxy for Progress 10 Database (to enable clients to push & pull data). Since the API standardization does not affect Jenark "product code", Jenark targets the following development dates to extract data and build calculations to pull account balance (during) 2019: • Association Data (names, association tables) • Residential Data Q1 • Accounts Payable, General Ledger Q2 Future Jenark software development plans include a standard new work order module, and online member portal to process credit card payments. Also, Jenark plans to upgrade the Progress Database to V.11 which may impact users of earlier

	versions if they upgrade to V.11. No date is announced for these plans. Jenark Integration Partners Offer Significant Functionality (See Appendix) This sponsor has identified examples of software platforms which integrate with Jenark Accounting Module and Work Order system: 1. FRONTSTEPS CONNECT 2. PILERA PREMIUM
Dependency on Infrastructure	Dependent on Corelogic successful standardization of API for integration with integration partners. Dependent on property management integration partner adoption of API standard. Dependent on GRF adoption of online member interaction through integration partner platforms such as FRONSTEPS CONNECT, PILERA PREMIUM and others to deliver member access to member/resident services, interaction, data in a secure environment.
Project Dependency	See Recommendation below, begin evaluation process in early 2020, with GRF Budget for the evaluation process approval in 2019.
Recommendation	Recommend a software evaluation process to compare in detail, the cost and benefits of the following core technology Initiatives: 1. Database Integration with Jenark API implementation 2. Community Association Management/Property Management conversion and implementation 3. Upgrade of Jenark Property Management software if Corelogic can deliver on implementation timelines and factor in the software vendor platform functionality outlined in the Jenark Upgrade Technology Project Description Appendix.

Option 2: Replace Jenark - with a combination of new community association/property management and access to resident services software

Community Association/Property Management Software (CAM/PM)	Sponsor	Mary A. England Della Temple	Purpose	Asset Preservation and Enhancement

Description	The Jenark Property Management system as it currently stands does not provide key functionalities around advanced decision- making analytics or resident service interaction. And, while Jenark plans improvement, it may never be able to offer a "one-database solution" to accommodate residents' changing needs. Our task was to research other property management/resident service software programs that do offer advanced interactive functionality. We began our research by reaching out to other 55+ communities who are dealing with the same issue. We contacted the IT and accounting staffs at 6 Leisure World communities, 6 Sun City communities, 2 additional over 55 communities and 2 multi-generational Property Owner Associations. We asked the following questions: What accounting/ property management program are you using? Do you offer a "resident portal" on your website and what services do you provide through that connectivity? Did you design your own system? Or, if you purchased a software package – which one and how's it working? Do your databases talk with each other? How? We also interviewed prospective Community Association Management/Property Management software vendors to identify their technology platforms and functionality. We interviewed the 10 most promising vendors and chose three configurations that we believe can accommodate both GRF and multiple Mutual membership requirements. **Configuration 1 –** Consider **MS GP Dynamics and Total e Integrated**. Sun City West, Sun City AZ Hot Springs Village POA and Bella Vista POA use this combination. Estimated pricing: Cloud: a) back office $89/user/month b) POS $115/terminal/month c) GP Dyn $125/user/month. On

	Premise: software licensing is based on users and modules. Guesstimate of $50,000 to $100,000. **Configuration 2** – Consider **Jonas** as main resident services platform. Sun City Palm Desert, Sun City Roseville, and Heritage Palms HOA are either using this program or moving in this direction. May need to pair with a separate property management program, maybe not. Pricing not available however some of the current users cite higher than expected costs. **Configuration 3** – Consider **Yardi** paired with a combination of some or all of the following: **SiPass, MindBody, Square 9 and Clubessentials**. Yardi offers only a web-based (cloud-hosted) solution. Yardi pricing: licensing is per dwelling unit with unlimited designated users. Pricing will vary depending on which modules/products are licensed beyond the core Voyager 7S program. Licensing for Voyager 7S is $45,000/year plus $0.75/unit/month, or approximately $105,000/year. Licensing fees for Clubessentials, SiPass, MindBody and Square 9 are additional yearly costs. We also suggest evaluating **Caliber, Buildium, TOPS[ONE] and Northstar** for possible inclusion in Configurations 1-3. Caliber pricing: a) Purchase approximately $36,020/year. b) Hosted $.025/unit/month or approximately $1,975/month. Additional pricing for Caliber Portal, the homeowner access portal, $10/month/association. TOPS[ONE] is a cloud hosted platform. Price: $5/annual/unit. Licensing fees for Clubessentials, SiPass, MindBody and Square 9 are additional yearly costs.
Criteria	
Costs Implementing And Operating	General cost estimate for property management/resident services configurations: Initial software licensing $100,000, project manager to shepherd conversion $125,000, contingency and staff training, $75,000. Yearly licensing, beginning in year 2, $50,000. Total = $350,000 over a two-year period of time. *(see Appendix B of CAM/PM TPD for Hot Springs POA/Total e Integrated price sheet)*
Savings	Projecting operational budget savings is just that, a projection. The 2018 GRF Operations Budget includes approximately $12M in labor costs. If even a 1% cost savings could be realized by the implementation of a new CAM/PM application, resulting in more efficient workflow, less redundancy of

	documentation, we project savings of approximately $120,000 per year.
# of People Served	All GRF members, residents, Mutuals, and employees who support interactions with them will benefit from more efficient workflow and stream-lined online communication. Contractors, vendors, real estate and prospective buyers may benefit as well.
Benefits	One database solution Ability to access cross departmental information
Risks	• If accounting and property management software systems are evaluated in the future, it is critical to understand the unique complexities of GRF and mutual membership that most likely will not be readily incorporated into an "off-the-shelf" software solution. Since most stand alone and web-based software packages are designed around the traditional multi-family housing format and modified to include master and sub associations for HOAs, they do not lend themselves well or easily to concurrent membership into two separate, distinct and unrelated entities. Any future consideration of accounting and property management software must carefully evaluate how the software can accommodate and/or be modified to process and manage Rossmoor's unique membership requirements, Trust and homeowner association accounting and work order management. • Conversion to new CAM/PM software is a major undertaking, requiring time and thoughtful pre-planning by an implementation team. • GRF change management will be needed to facilitate new workflow processes to realize operational efficiencies.
Impact of Timing	A number of proposed technology projects can be integrated within new CAM/PM Solution modules. These include: Online Work Order, Event Management, portions of GRF Member Interaction, Electronic Funds Transfers, etc.
Dependency on Infrastructure	A successful CAM/PM conversion is dependent on the people involved in the implementation process and the skills they bring to the task. It is also dependent on clean, accurate data and significant operational planning. A dedicated program implementation project manager will need to facilitate the conversion process in detailed planned phases.

Project Dependency	A number of proposed technology projects can be integrated within new CAM/PM Solution modules. These include: Online Work Order, Event Management, portions of GRF Online Member Interaction, Electronic Funds Transfers, etc.
Recommendation	Establish a GRF technology evaluation team in early 2019 that will assess Jenark's development timeline and review alternative property management/resident service applications such as those listed below Configuration 1 – Consider MS GP Dynamics and Total e Integrated. Configuration 2 – Consider Jonas as main resident services platform. Configuration 3 – Consider Yardi paired with a combination of some or all of the following: SiPass, MindBody, Square 9 and Clubessentials. We also suggest evaluating Caliber, Buildium, TOPS[ONE] and Northstar for possible inclusion in Configurations 1-3.

Option 3: Modern Online Infrastructure - develop in-house IT system

Modern Online Infrastructure	Sponsor	Chris Slee	Purpose	Amenity Enhancement
Description	Today most of the GRF software is offline with back office applications managed by staff for internal use. A modern online infrastructure features websites that have evolved to using "tools" and "frameworks" rather than traditional coding of static web pages. The central tool of such an infrastructure is the Content Management System (CMS). CMS provides the base functions necessary for all web user applications. These functions include registration and access control, content and document management, and templates that can define a uniform appearance throughout the entire website. Data and documents are separated from the physical web pages to simplify administration and easily provide a dynamic environment. A CMS tool is configured by the organization; not coded. Features are added to the CMS with plugins that are selected from massive libraries at little or no cost. Wordpress, Joomla!, and Drupal are examples of the top three CMS systems (by registered users). These are open-source implementations that are supported by large communities,				

	thus, having no dependencies on a single company that might suddenly be shut down or be merged with another company. • This is a major project that will supply the platform for a modern web infrastructure that will support the GRF, MOD and the entire Rossmoor community. Since the platform is very flexible it can be introduced gradually, guided by a professional consulting company review. • Further, we have not addressed a way to integrate back to the accounting/property management software database. That becomes important if we are trying to do online work orders or pay our coupon. Joomla! or Wordpress do have accounting plugins (like Quickbooks) but they are not nearly robust enough to handle property management.
Criteria	
Costs Implementing And Operating	Implement a CMS[45] [content management system] based infrastructure: • SW: < $2,000/yr. for unlimited sites • Labor: Depends on scope but less than 1 month initially Operating: SW: < $2,000/yr. for unlimited sites
Savings	Lots of manual costs around all operations. Move content submission out to the creators and replace/reduce staff involvement [a bottleneck and limitation]
# of People Served	1,000s of residents, perhaps 100,000s of transactions
Benefits	Move processes online, enabling residents to interact online and self-serve, like everything else we now do since the adoption of the web. [i.e. without having to go to a booking clerk, notice board, etc. etc.] Removes bottlenecks in current content update and distribution processes
Risks	none
Impact of Timing	Sooner the better to simplify processes
Dependency on Infrastructure	Web server – this infrastructure enables future productivity enhancements

[4] https://www.rjionline.org/stories/tools-we-use-1-publishing-print-newspapers-online-cmss
[5] https://www.rjionline.org/stories/tools-we-use-2-publishing-print-newspapers-online-servers

Project Dependency	Modern Online Infrastructure Web Competent Technical: Someone with basic Technical Expertise
Recommendation	The GRF Ad Hoc Technology Committee is not recommending this option for the following reasons: • Implementing this type of content management system (CMS) from scratch would likely require a major design effort from a team of CMS knowledgeable consultants. • Ongoing support and maintenance for a one of a kind highly customized system would be a risky endeavour.

Recommendations for Major Long Term Projects

The GRF Ad Hoc Technology Committee recommends the evaluation of the first two options presented above - Upgrade Jenark & Implementation of Standard API and Replace Jenark with new CAM/PM software.

The Committee does not recommend Option 3 – Modern Online Infrastructure for the following reasons:

- Designing from scratch would likely require a major design effort from a team of CMS knowledgeable consultants.
- A one of a kind highly customized system would be a risky endeavour.

Additionally, the Committee makes the following recommendations for the next steps in exploring future GRF IT technology:

1. Establish a GRF Technology Evaluation team for early 2019 to:
    a. Monitor CoreLogic's progress on its Jenark transition.
    b. Monitor the progress on the Data41 project's ability to integrate the disparate databases.
    c. Do in-depth assessment of Jenark's development timeline.
    d. Evaluate third party software identified in the CAM/PM Technology Project Description.
    e. Determine if one or more of these systems offer superior functionality to an upgraded Jenark system. If superior systems are identified, the Committee recommends the Board seriously consider migrating to the new system.
    f. Research other third-party software vendor platforms offering integration with an IT system of choice.
    g. Conduct needs assessment survey on member interest in accessing GRF services through IT (online, mobile devices, etc.).

GRF Already Funded

Three projects we studied have been approved by the Board, funded and completed in 2018. They are:

Emergency Back Up Infrastructure
GRF EV Charging Stations
Robust Back Up System

Emergency Backup Infrastructure	Sponsor	M. A. England	Purpose	Asset Preservation, Safety
Description	GRF acquires emergency back-up power generation, phone system, battery-powered generation to support phone & IT systems and need to divide server capacity to high load & high demand.			
Criteria				
Costs Implementing And Operating	Back-up power generators for servers & phone systems funded for $93,000. Nimble data storage funded for $58,600. Secondary phone system funded for $10,300. Gateway battery backup funded for $9,000			
Savings	Support for GRF operations in event of an emergency is vital and loss of business continuity is at risk			
# of People Served	All GRF members, 18 Mutuals, 240 employees are served in an emergency incident			
Benefits	Available power generation to support phone or radio communication, to sustain or restore IT computer-based operations, are all critical components of business recovery from an emergency loss of power			
Risks	Contingency planning for back-up to back-up power may be of value			
Impact of Timing	GRF/MOD operations have been impacted in the absence of back-up systems.			
Dependency on Infrastructure	Dependency on PGE power restoration after three days will be necessary for GRF Gate security systems to operate.			
Project Dependency	Will the GRF Solar project be able to provide emergency power generation?			
Recommendation	N/A Already Funded			

GRF EV Charging Stations	Sponsor	Fred Kern Dave Vereeke	Purpose	Amenity Enhancement

Description	We presented a PG&E grant opportunity to install EV Charging Stations on GRF common areas within Rossmoor. The PG&E Charge Network program pays for, owns, maintains and coordinates construction of the infrastructure from the transformer to the parking space. Optionally they will own and maintain the EV chargers for ten years including the cost of the billing network. GRF management reviewed the program, selected the option to have PG&E maintain full ownership and maintenance of the EV charging equipment and presented it to the GRF board for approval. The program was approved, funded and will completed by the end of October, 2018.
Criteria	
Costs Implementing And Operating	GRF selected the option to pay a portion of the cost for each of the 30 charging stations installed. The GRF Board approved an expenditure of $55,000 with PG&E assuming all operating costs for 10 years. After the 10-year period GRF will own the equipment and can assume the operating expense or can shut the operation down and liquidate the assets.
Savings	If there is a demand for charging stations on the GRF common property in the future, the decision to implement this program will more than justify the expense. Further, the GRF will be collecting a fee on each EV charging session that will be applied towards reimbursement of the expense outlined above.
# of People Served	Thirty stations have been installed; 10 each in the Gateway, Event Center and Fitness Center. The stations are available to all residents. Benefits will be realized as the EV market matures.
Benefits	It is very expensive and difficult to establish charging centers in many of Rossmoor Mutuals due to the aging electric infrastructure that has little excess capacity. The installation of the 30 charging stations provides some local charging benefit to all residents. The PG&E program potentially saved GRF $150,000 that they may have incurred in the future when demand for charging station is expected to increase.
Risks	Minimal. The GRF should be able to recoup their investment during the lifetime of the grant. PG&E assumes all responsibility for maintenance of charging station and infrastructure
Impact of Timing	None
Dependency on Infrastructure	Covered by the PG&E Charge Network Program

Project Dependency	None. Installation is complete
Recommendation	N/A. Already Funded.

Robust Backup System	Sponsor	M. England	Purpose	Asset Preservation
Description	GRF acquires in-house & cloud-based data storage as backup for applications and multiple databases			
Criteria				
Costs Implementing And Operating	Project funded in 2017 for $20,000, implementation to be completed in 2018.			
Savings	16 Terabytes in-house data storage and unlimited cloud storage by Barracuda Networks is adequate capacity			
# of People Served	GRF data security and storage backup serves approximately 10,000 GRF members, 18 Mutuals, 240 employees.			
Benefits	Improved offsite data backup storage will benefit all by improved reliability, fault-tolerant servers, data security, privacy, and encryption			
Risks	The previous data storage of 2 Terabytes was inadequate data backup.			
Impact of Timing	Completion expected 2018			
Dependency on Infrastructure	Cloud back-up depends on reliable data and network security. Internet connectivity, Barracuda and power access			
Project Dependency	Dependency on $11,100 GRF IT controlling backup network server, also funded 2017.			
Recommendation	N/A – Currently funded			

Parking Lot Items

The Committee's charter is to address GRF related technology issues. In some of the Committee's research, it identified items that were either out of the scope of the Committee's current charter or were in some cases more germane to the Mutuals' areas of responsibility. Rather than simply ignore those items that were out of scope, the Committee set up a "Parking Lot" to keep a record of the issues. It is envisioned that those items pertinent to the Mutuals will be presented to them at a later point in time.

These projects are:

- Dead Spots in Cellular Service
- Docu-Sign
- Online Work Order Systems – Mutuals
- Sewage Treatment/Water Reclamation Plant
- Shared EV Charging Stations – Mutuals

Dead Spots Cellular Coverage	Sponsor	Bob Kelso	Purpose	Amenity Enhancement
Description	Many residents have already eliminated their landline but with spotty cellular coverage this can be an inconvenience but more importantly a health risk if they can't make emergency calls. Those residents who might have good coverage at their home might not have coverage in other parts of Rossmoor limiting their ability to call emergency services. Eliminating dead spots across the Rossmoor Valley will solve this safety concern.			
Criteria				
Costs Implementing And Operating	Possible addition of new cell towers			
Savings	None to GRF however, cellular coverage with no dead spots will allow more residents to eliminate landline coverage saving at least $240 per year			
# of People Served	Some people have access to phones with Wi-Fi calling and with the new Comcast contract 95% of all Manors now have Wi-Fi.			
Benefits	Resident amenity			
Risks	Difficulty of getting new towers authorized by 4 cell phone companies. Difficulty of permitting process			

Impact of Timing	
Dependency on Infrastructure	Cell companies provide the towers and its fairly impossible for individuals or even a community to impact their decision-making process
Project Dependency	None
Recommendation	No recommendation at this time. Possible future discussion of how to leverage our buying power with cell company who would provide the tower.

Docu-Sign	Sponsor	Della Temple	Purpose	Amenity Enhancement

Description	DocuSign (docusign.com), a San Francisco based company, is the premier electronic signature and digital transaction management service, with over 200 million users. **How Electronic Signature Applications Work**: • Open the software application (DocuSign), upload a Microsoft Word or PDF document, drag and drop sticky notes to indicate where signatures are required, add list of recipient's names and email addresses, click send. • Allows recipient to review and sign documents digitally instead of in-person. • Allows sender to track process easily on application's dashboard. Sender has options to set signing order of recipients, track progress of document through the signing process and can easily turn the document into a template to streamline future workflow. **Purpose:** • One of the main software applications of an almost paperless office. • Reduces need to print, scan and store paper copies of documents thereby reducing operational costs. It was initially thought that Mutual Presidents might appreciate the opportunity to sign documents at their leisure, without the need to do so in person. At this time however, the preference of the Mutual Presidents forum is to not utilize this software application.

	At some point within the next five years, this stated preference may shift. With this in mind, we present the following information on e-signature services.
Criteria	
Costs Implementing And Operating	General Plans - $40/user/month Company-wide API application, costs dependent on # of documents per month. Cost is comparable to other e-signature applications Implementation Cost = zero Cost per year for 1 license = $480
Savings	Reduced cost of printing and paper saves on monthly coupon. Saves time and more efficient workflow of GRF Staff
# of People Served	Rossmoor staff and residents who interact with staff
Benefits	Fully digital audit trail for compliance and legal enforceability. Secure transmission of sensitive documents. DocuSign exceeds the most stringent US, EU and global security standards. A simple first step in move to almost paper-free work environment.
Risks	Not suitable to all departments. Example: The State of California currently requires a “wet signature” on all notarized documents. It is estimated that between 25% and 50% of all cooperative sales have mortgage loans attached to them, limiting the use of DocuSign in the Member Records department. Staff time required to set up templates and transition to a paperless document environment.
Impact of Timing	None
Dependency on Infrastructure	None

Project Dependency	None
Recommendation	It could be in two or three years, Mutual Presidents will welcome this as a time-saving tool. Until then, we recommend a wait and see attitude and no purchase at this time.

On-Line Work Order System	Sponsor	Vicki Swisher Mary England	Purpose	Asset Enhancement

Description	The current GRF/MOD work order system has many offline, manual, and paper-based interfaces for inputting data and providing worker information in the field, accounting hand-offs and payment processes. These gaps in automation present many opportunities for work process flow improvements, efficiencies, and upgrades to the work order system. GRF has the following change options to choose from with timeline estimates: Option #1 - Develop and implement a simple email-based service order request template to be launched on Rossmoor.com (2018). Option #2 - Develop and implement a member Portal on Rossmoor.com linked to the Jenark work order module via Third Party Software (2019). Option #3 - Upgrade existing Jenark Property Management software to include the following functionality (2019): • #2 above • Resident work order tracking • MOD/Mutual reports • Contract Management • Automated owner and mutual invoicing • Interface with receivables, purchase orders, and inventory • Wireless PDA integration for work order resolution **OR** Option #4 - Evaluate, select, customize, and implement a new integrated, Community Association Management/Property

	Management Software Solution with modules appropriate for GRF/MOD (2023).
Criteria	
Costs Implementing And Operating	• Option 1 - Minor improvement to work order requests, but may assist MOD Service Order Specialists. Estimate cost based on 80 man-hours at $125/hour. Initial Investment $10,000 Operating Costs per Year Same as current costs • Option 2 - Requires purchase of Third-Party software, installing security to enter work order database, training personnel, and providing instructions to Rossmoor residents. The costs below are based on information from Pilera, a Third-Party provider working with Jenark. These costs do not include installing security, MOD training, and resident instructions. There is no data currently available to determine these costs. Initial Investment $2,650 Operating Costs per Year $4506 + Current Jenark licensing fees • Option 3 - Requires installation of current Jenark work order module software revision, installing security to enter work order database, training personnel, and providing instructions to Rossmoor residents. The costs below are only for the installation of current Jenark work order module software revision and transfer of data by CoreLogic. This cost is based on previous similar work. There is no data currently available to determine the other costs. Initial Investment $8,000 Operating Costs per Year Current Jenark licensing fees Option 4 - See Project Criterian for CAM upgrade.
Savings	• Option 1 - Provides level of convenience to residents. Savings per Year $0.00 • Option 2 - May eliminate some man-hours per year of Service Order Specialists support at a rate of $55/hour. However, no credit is being taken for this savings at this time. Service Order Specialists may still require follow-on telephone call(s) to requestor to complete / understand work order. Processing the work order will remain the same (e.g. verifying work is owned by Mutual, scheduling work, and processing costs). Savings per Year $0.00

	• Option 3 - May eliminate some man-hours per year of Service Order Specialists support at a rate of $55/hour. However, no credit is being taken for this savings at this time. Service Order Specialists may still require follow-on telephone call(s) to requestor to complete / understand work order. Processing the work order will remain the same (e.g. verifying work is owned by Mutual, scheduling work, and processing costs). Savings per Year $0.00 Option 4 - See Project Criterian for CAM upgrade.
# of People Served	All residents of Rossmoor are served by upgrading work order process.
Benefits	May reduce MOD/GRF coupon by lowering work order costs.
Risks	The majority of residents may continue to call the work order desk and not use the on-line work order system.
Impact of Timing	None
Dependency on Infrastructure	Costs for options 1, 2, and 3 are based on maintaining the Jenark system.
Project Dependency	Options 1, 2, and 3 should not be considered if option 4 is selected.
Recommendation	The work order system is primarily used by the Mutuals rather than GRF. Since the cost of this technology upgrade will be the responsibility of the Mutuals, the GRF Technology Ad Hoc Committee recommends that this project be placed in the Mutual Parking Lot.

Sewage Treatment/Water Reclamation Plant	Sponsor	Bob Kelso	Purpose	Asset Preservation
Description	Build a water reclamation plant to process sewage from Rossmoor into irrigation water. This will insulate GRF from possible future mandated restrictions in EBMUD water for irrigation. The golf course alone uses between 67 and 100 million gallons of potable water a year. Even without a drought the cost of using potable water for irrigation keeps rising. This is a current GRF Board goal and is an action item in the updated General Plan adopted by the GRF Board in 2016. A feasibility study is now being done by a consultant.			

Criteria	
Costs Implementing And Operating	The cost could be between $6,000,000 and $10,000,000. There would be a number of years for design and approvals. An outside contractor would be hired to manage the plant. All these details should be in the feasibility study.
Savings	How much is the golf course and our landscaping worth?
# of People Served	All residents would benefit
Benefits	Most residents mention Rossmoor's physical beauty as one of its most important assets. Home values are higher because of this. Many people move to Rossmoor to golf. Without a golf course the value of homes would decline. If a drought caused much of the golf course and other landscaping to die many millions of dollars would be required to rebuild and replant.
Risks	Costs could be too high. Permits may be impossible to get.
Impact of Timing	Given the extended design and construction timeline delay could mean a drought could wreak havoc on GRF landscaping before the project is completed. Permitting is only becoming more and more difficult. Contra Costa Sanitary District, the current owner of our sewage, is mulling over contracts with other water districts that might restrict our ability to use our sewage
Dependency on Infrastructure	Money is the only real dependency. A possible location has already been tentatively identified.
Project Dependency	None
Recommendation	The GRF Board will wait for consultant's report and decide whether GRF can afford the project

Shared EV Charging Stations-Mutuals	Sponsor	Dave Vereeke	Purpose	Amenity Enhancement Asset Enhancement
Description	This is a plan for the GRF Mutual Parking Lot. The plan guides residents who wish to pool resources to establish shared EV charging Stations (EVCS) on Mutual common property. CA Civil 4745 allows individual residents to claim Mutual common parking spaces to			

	establish a private EVCS if it is too costly to establish an EVCS in their parking location. This plan is designed to provide a more equitable means of establishing charging stations. One station will serve 6 residents, thus, eliminating a run on scarce parking spaces.
Criteria	
Costs Implementing And Operating	All costs are borne by the participating residents. There is no cost to the Mutual.
Savings	A participating resident pays ⅙ of the total cost of installation.
# of People Served	The program is open to all residents of the Mutual. However, due to the limited number of parking locations that are economically feasible to populate with an EVCS, it may become limited to residents on a first come, first served basis.
Benefits	A shared EVCS provides convenient charging at a low investment cost. Limiting the number of users to a given station assures adequate availability of charging services to each participant.
Risks	Resident purchased stations will provide service to Mutual members only, thus limiting traffic in and out the Mutual. The Mutual is not financially responsible for the operation or replacement of the equipment. The charging group will provide insurance.
Impact of Timing	There are grants available from MCE until March, 2019 that provide $2500 per charging head to establish shared charging stations. Limited parking locations may limit the number of residents served.
Dependency on Infrastructure	The program is limited by the number of cost-effective parking spaces available within the Mutual
Project Dependency	None
Recommendation	Provide information to all Mutual Presidents and encourage further study.

Final Thoughts

The Ad Hoc Technology has spent a busy 18 months researching a wide variety of projects that cover the gamut of technology. Some of the projects are easily implemented; others anticipate technology advances that will make them practical within a few years.

We have included the detailed Technology Project Description Reports (TPDs) for each project in the Appendix to the Board report, provided to you under separate cover. There you will find extensive backup information that will hopefully serve as a useful tool in understanding some of the more complex recommendations.

And, of course, the Committee members will be available for consultation in case additional detail is needed.

The Rossmoor Ad Hoc Technology Planning Committee
Fred Kern, Chair
Mary England
Chris Slee
Vicki Swisher
Della Temple
Dave Vereeke
Heinz Weihrich
Bob Kelso, ex-officio and Board representative