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B03.1 Introduction

B03.1.1 Framework

Coordinated parking is a broad framework that includes multiple strategies aimed to right-size parking assets on Tyndall Air Force Base (AFB) to reduce unnecessary costs and bolster base mobility in a campus-like environment.

Coordinated parking should be assessed as a key component of Integrated Mobility presented in **Section B02, Integrated Mobility Framework**. This section provides data and the methodology to achieve coordinated parking goals and objective described below.

Detailed criteria for Coordinated Parking is described in **Section C03, Parking Areas**.

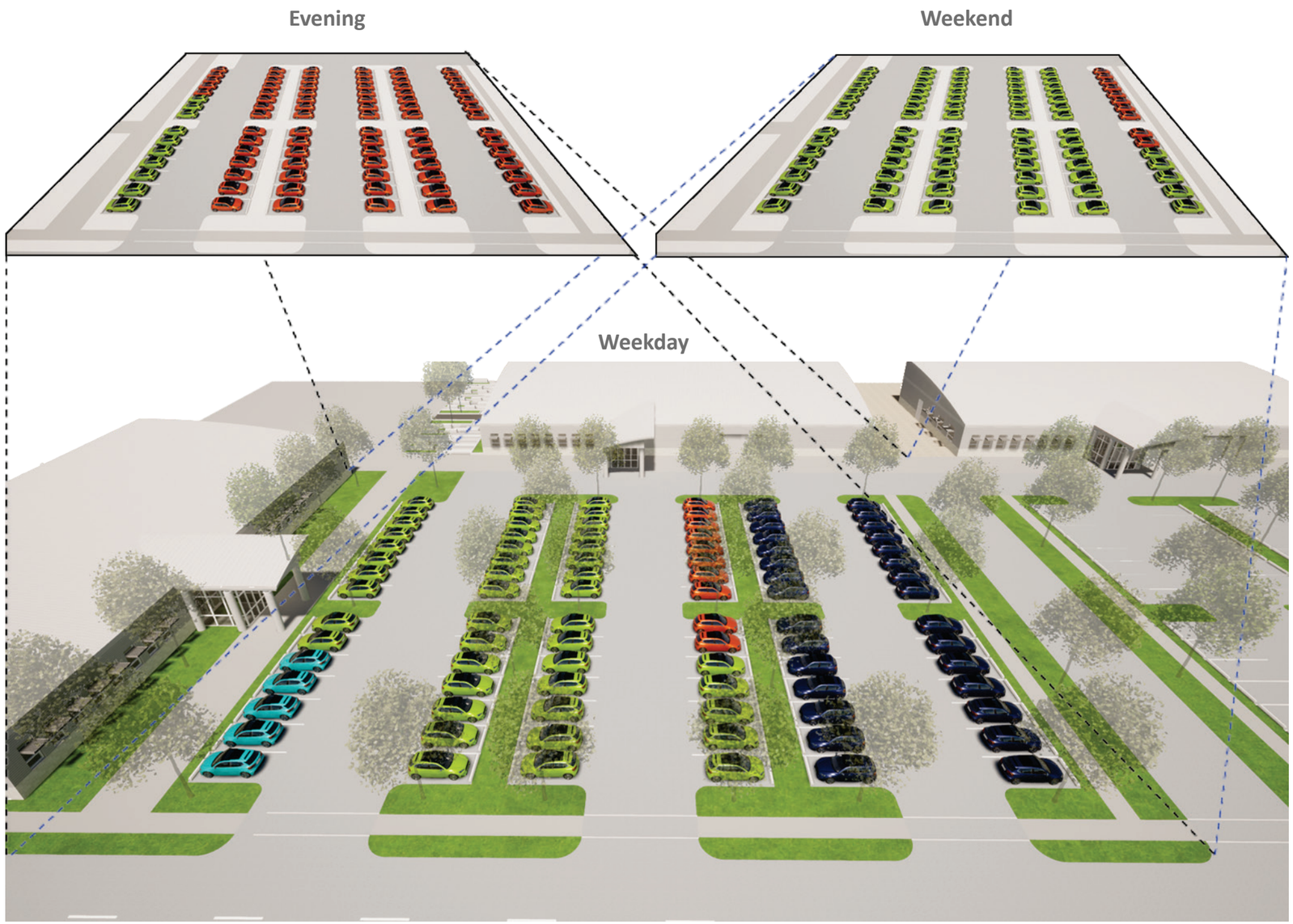
B03.1.2 Goals

- Reduce unnecessary parking construction and maintenance costs by using improved demand modeling strategies to right-size parking assets
- Strategically locate parking on base to maximize utility and improve safe, pleasant, and meaningful connections between buildings
- Integrate parking and mobility strategies to encourage a more walkable and bikeable campus-like base design

B03.1.3 Objectives

- Coordinate site development activities with Tyndall AFB planning staff
- Develop and locate parking assets so they can be shared by surrounding uses when possible
- Use Urban Land Institute's *Shared Parking* demand methodology to supplement the parking ratios in Table B-2 of Unified Facilities Criteria (UFC) 3-201-01, *Civil Engineering*, to right-size parking areas and consider nearby facilities and uses
- Allow excess existing pavement to revert to natural permeable state

Exhibit B03-1. Shared Parking Concept



Sample shared parking usage in a typical parking lot; percentages are shown on Exhibit B03-2

B03.1.4 Key Planning Principles of Coordinated Parking

When individual facilities provide required parking for their anticipated peak demand—as is typical in many vehicle-centric mixed-use environments and reflected in UFC parking ratios—users are encouraged to drive from place to place, parking their vehicles at each location. If adequate parking were provided individually by all (or even most) of the installation's collective facilities, most people would exhibit this behavior and have little incentive to use alternative mobility options such as walking, biking, or potential shuttle services.

Not only would this general status quo in base mobility fail to meet the base's walkability goals, but it would prevent Tyndall AFB from achieving is goal to become the Installation of the Future. A 2014 study by the Institute for Transportation & Development Policy (ITDP) found that shared parking can reduce parking requirements by 20 to 40%.[1]

The following planning concepts guide the coordinated parking strategy discussion and must be considered in development opportunity evaluation.

View Parking as an Installation Asset

Traditional parking demand is based on individual facilities and their primary functions, whereas mixed-use developments, such as Tyndall AFB, are purposely designed for multiple uses operating in proximity to each other. When the facilities in a mixed-use development all build their own parking areas, there is a disconnect between the purposeful clustering of facilities and the use of land for parking purposes. This disconnect means providing parking based on individual facility use will inevitably oversupply parking and increase the spacing between facilities, both of which significantly diminish the base's walkability.

In a coordinated parking strategy, parking assets are viewed as an installation-wide amenity serving all nearby facilities. Not only does this promote the coordination and sharing of spaces, reducing construction and maintenance costs, but also encourages future development to orient facilities in higher densities and increase the viability of connections between buildings.

Use Demand Modeling Best Practices

As is explained in **Section B03.2**, the parking development process supplements UFC 3-201-01 parking ratios with Urban Land Institute's Shared Parking Model parking rates from the *ITE Parking Generation Manual*, 5th ed. This model is designed for mixed-use developments and assists in identifying potential shared uses and avoid unnecessary cost.

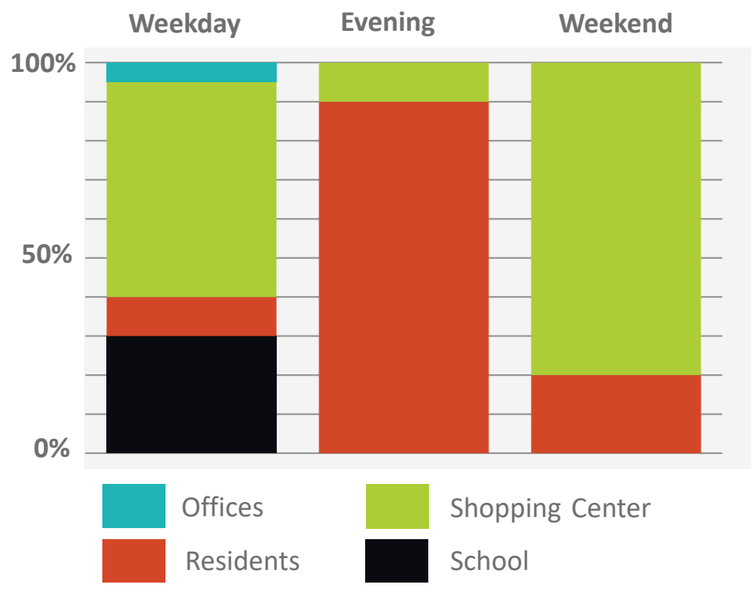
The Sample Shared Parking Usage chart to the right is based on a study of similar mixed-use developments. Whereas each housing or school use has its own needed parking spaces, they do not need them at the same time; school parking is needed primarily during the day and when residential parking is needed in the evenings and on weekends. Employing a modeling process to identify similar opportunities helps right-size base parking assets as well as improve mobility and quality of life.

[1] Kondransky, Michael. 2014. "What is Shared Parking?" *Transport Matters*. Institute for Transportation & Development Policy. December.

Benefits of Coordinated Parking:

- Optimize location and size of parking areas
- Reduce parking construction costs
- Minimize runoff from parking areas
- Reduce heat island effect from excess parking

Exhibit B03-2. Sample Shared Parking Usage[1]



Achieve Installation Goals through Integrated Design

The *Tyndall Air Force Base Master Plan* states the installation design should "promote campus like environment, live in dorms and walk to fitness… walk to community support, walk to workplace; Monday to Friday without getting into vehicles." Not only will reducing space between buildings devoted to storing vehicles increase the likelihood of achieving this vision but having a coordinated process in each district as described in **Section C03, Parking Areas,** that can engage across zone boundaries and between uses will ensure the installation works as a cohesive unit as opposed to a collection of parts in proximity.

Evaluate Parking Development Impacts to Access, Network, and Experience

Detailed more fully on the following page, parking assets must be considered in relation to how they are located on the site and how they connect to surrounding facilities and the installation. Making the primary external connection point (the parking lot) an integral component to the overarching mobility framework will attract users and motivate them to walk or bike for their internal trips rather than moving the car and parking in another lot on base for each successive trip throughout the day.

B03.2 Planning Approach

B03.2.1 Integrated Mobility & Parking Development

Evaluate Impacts

The success around parking and overall base mobility can be focused into three integrated characteristics: Access, Network, and Experience. In initial installation construction and in future programs, improvements in parking planning, design, and development are considered as they apply to these three characteristics. By doing so, a more comprehensive strategy will guide the connections within the installation and a more walkable base can be achieved.

Provide Access

The base's intent for parking areas is to provide access to the surrounding facilities for the predominant mode of travel at the base, which is by personal vehicle. Critical to Tyndall AFB becoming the Installation of the Future, however, is what resources are accessible from the lot once the vehicle is parked. Is the lot discreet to an individual facility with inconvenient or no connections to the wider mobility framework? If so, any trips to other base destinations will require the continued use of a vehicle and will perpetuate increased circulating vehicle traffic within the installation.

The preferred access will include locating parking areas in proximity to multiple buildings and developing connections to not only the immediate facilities but also the proposed bicycle and pedestrian network on base.

Connect to the Network

Strategically locating parking areas with optimized access in mind not only provides more opportunity for shared, or coordinated, parking assets but also improves mobility throughout the base and offers alternatives for internal trips. Parking areas must be viewed as part of the network and have direct connections to network links around the lot even when not tied directly to the immediate facility.

Provide a Choice Experience

Integrated network and base design must provide a user experience that is viewed as beneficiary; a feeling where given the choice, one would choose to walk 5-10 minutes over using a vehicle to travel a quarter-mile away. The majority of daily base functions operate within an accessible area in the Flightline and Support Districts, so making the connections between destinations an attractive alternative has a significant impact on what choice is made.

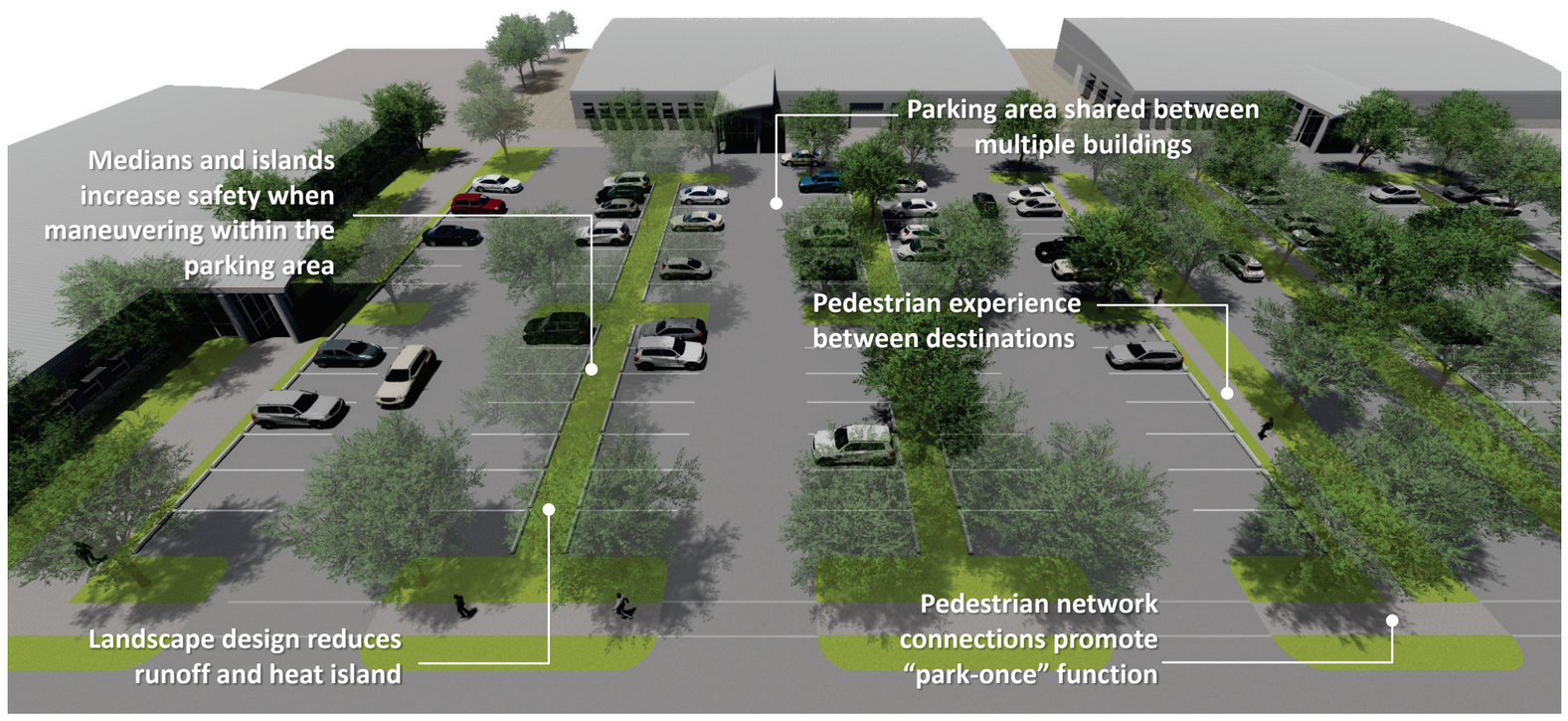
Critical components in providing a positive experience within the parking areas and the proposed mobility framework, along with their relevant sections in this document for further detail, include shaded walkways (**C06, Landscape**), available seating (**C07, Site Furnishings**), informative signage (**C08, Pedestrian Signage**) and security lighting (**C09, Lighting**).

Exhibit B03-3. Coordinated Parking Strategy – Access, Network & Experience

Coordinated Parking Strategy – Access, Network & Experience

ACCESS	NETWORK	EXPERIENCE
• Future parking development design evaluated with an intent to: » Locate parking in proximity to multiple facilities when applicable » Make direct connections to overall network around the lot and the immediate facility	• Enable the ability to "park once" and establish connections around the lot to nearby facilities when available	• Encourage safe walking within parking areas with buffered lanes and appropriate landscaping • Maintain parking areas and connections along with components that encourage walking by including shade, lighting, available seating, and signage

Exhibit B03-4. Preferred Parking Area Design Concept



Coordinated Parking Methodology

The coordinated parking methodology for Tyndall AFB has been adapted by the widely accepted standards described in the Urban Land Institute publication *Shared Parking (Third Edition)*. This methodology, shown in Exhibit B03-5, compares the parking demand by time of day and type of use, which shows how the same parking spaces associated with a daytime use (for work or school) also can be used by an evening or overnight use (residential).

The coordinated parking concept is also supported by the Institute of Transportation Engineers (ITE) and communities around the world.

The Tyndall AFB coordinated parking analysis used parking ratios from the UFC 3-201-01 related to each of the new facilities on the base.

To develop coordinated parking recommendations for Tyndall AFB, each district or subarea requires specific analysis to determine the appropriate strategies that will meet the distinct goals of each district and the overall base.

A coordinated parking boundary is defined for the MILCON area, shown on Exhibit B03-6, and is identified as a candidate for a coordinated parking strategy:

- Facilities with compatible uses (such as dormitories and retail) that can share parking assets because of the differences in their hourly demand distribution
- Good connectivity between buildings and parking lots
- Proximity (5-10-minute walk) between parking and buildings

The following information describes the coordinated parking area in the MILCON area, summarizes the analyses performed for each coordinated parking area, and presents an example for implementing a shared parking strategy at Tyndall AFB.

Coordinated Parking Areas and Parking Savings

Analysis results displayed below show considerable potential space and cost savings that can be realized through a coordinated design. Each coordinated parking area (labeled A through I) shows the savings in either reduction of new parking to be built or existing spaces that can be returned to their natural state. These results are broken down in the summary tables in **Section B03.4**.

Primary opportunities involve the base's core functions in both the Flightline and Support Districts due to the increased density and diversity of land uses that are more conducive for a coordinated parking strategy.

The coordinated parking area boundaries were determined by logical breaks in development and surrounding land uses. Further coordination could result in shared parking potential across these analytical boundary lines.

For example, although there are significant opportunities to reduce parking in Coordinated Parking Areas E and F, further synergies can be realized between the two as well. This is particularly critical regarding the viability of the comprehensive mobility framework and pedestrian, bicycle, and a proposed shuttle service transecting these areas along the Multi-Modal Spine.

Exhibit B03-6. Coordinated Parking Areas

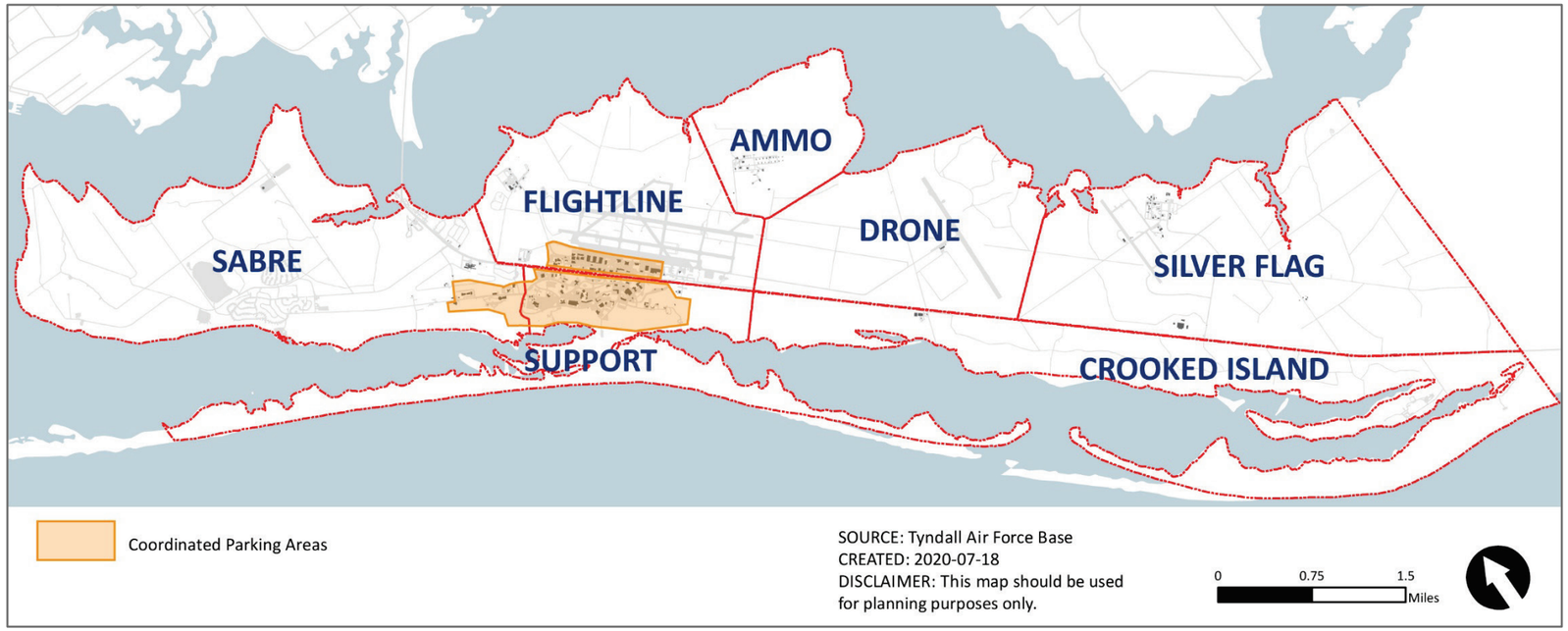


Exhibit B03-5. Coordinated Parking Methodology Flow Chart

Gather / Review Project Data	Develop Shared Parking Areas	Select Parking Ratios	Select Factors	Calculate Shared Parking Demand
▪ Building locations, types, and magnitudes ▪ Local mode split	▪ Walkable ▪ Compatible uses ▪ Agreements and direction	▪ UFC ▪ Urban Land Institute/ITE ▪ Personnel, resident, visitor	▪ Use type ▪ Time of day	▪ In coordinated parking areas ▪ In Flightline and Support Districts ▪ On Tyndall AFB

B03.3 Key Planning Strategies

B03.3.1 Coordinated Parking Typologies

The coordinated parking strategy considers four parking typologies: shared parking, remote parking, efficient-mode priority parking, and parking structures.

Shared Parking

Parking areas are oriented to be accessible between multiple buildings that are close to each other and have compatible uses (that is, differing parking demands based on time of day or day of the week). Using the shared parking demand methodology discussed in **Section B03.2**, these synergy opportunities can be identified and used to direct site design in the following primary ways:

- Location, orientation, and design of the building in relation to existing or future uses
- Parking area location and design provide optimal access to existing and proposed proximate uses
- Connections to sidewalks and trail network are established both toward and away from the proposed building to improve site and overall installation access and mobility

Exhibit B03-7. Shared Parking Concept

Remote Parking

Strategically locate remote parking where special event or occasional overflow parking is needed. Design remote parking areas without raised interior curbs and to be flexible and pervious for multiple uses. Beyond typical parking use, this area could be event parking for remote installation sites and connected via shuttle or a temporary staging space during a response event. To meet installation mobility goals, remote parking should be adequately connected to the bike and pedestrian network.

Exhibit B03-8. Remote Parking Concept

Efficient-Mode Priority Parking

Reserve and designate non-accessible parking spots near building entrances to encourage higher efficiency vehicular options such as carpooling, vanpooling, and electric vehicles. Designate efficient-mode priority spaces with signage and/or pavement markings.

Exhibit B03-9. Efficient-Mode Priority Parking Concept

Parking Structure

A parking structure can be considered where a lack of developable space is available to provide adequate parking assets. The IFS dictates design elements of parking structures. The benefits of a structure in this situation could justify the additional cost in constructing a parking structure if the potential area meets one or more of the following considerations:

- Parking demand for surrounding mission uses exceeds available space and remote parking connected via shuttle and bicycle/pedestrian network is unavailable
- Opportunity to combine adjacent parking lots into a shared parking structure and increase the potential for use of the structure and surrounding areas (thus repurposing the parking asset for a more critical use)
- Parking structure will be located close to available connections such as sidewalks, shared-use paths, and the Multi-Modal Spine
- The parking structure is designed with multi-purpose functionality such as staging area, extreme-weather shelter, or installation utility storage

Exhibit B03-10. Parking Structure Concept

B03.4 Benefits of Coordinated Parking

B03.4.1 Life-Cycle Cost Comparison

To compare the potential cost impacts of using a coordinated parking strategy on base, a life-cycle cost comparison analysis was conducted using ECONPAK software and included the estimated capital and operating expenditure for parking facilities on base. These assumptions were based on similar facilities in the region and historical base expenses. The following provides an example as a type of study that should be completed for each district or subarea.

Non-financial benefits of runoff reduction and impact to heat island effect on base that can be expected with a reduction in parking was also considered.

Coordinated Parking Reductions

Under this coordinated parking strategy, 968 spaces that were planned to be built under UFC code and the current rebuild design can be reduced from the program. Assuming a general cost of $5,000 per space, this would reduce construction costs by more than $4.8 million. A detailed breakdown of the comparison between the traditional and shared parking demand strategies as it relates to the nine coordinated parking areas is included in Exhibit B03-11.

Exhibit B03-11. Parking Demand Results by Coordinated Parking Area

Coordinated Parking Area	Weekday		
	UFC Strategy	Shared Parking Strategy	Spaces Saved
A	115	102	13
B	681	681	0
C	559	549	10
D	90	89	1
E	2,594	1,952	642
F	1,222	942	280
G	675	656	19
H	532	529	3
I	487	487	0
TOTAL	6,955	5,987	968

The majority of these space savings come from the core of the Support District where a planned density and mix of land uses make the area conducive for coordinated parking and ensure this critical common area is not diluted by an oversupply of empty parking spaces.

Oversupplied Existing Spaces with Reduced Maintenance

In addition to spaces that can be removed from the program and reduce the build cost for the base, additional “existing to remain” spaces can impact the bottom line by being removed from the maintenance schedule and allowed to return to a natural permeable state over time. This strategy would apply to oversupplied existing parking that can be used for overflow parking as needed.

More than 2,600 existing parking spaces were determined to be “oversupply” using the shared parking model. Counts per coordinated parking area are shown in Exhibit B03-12. Using an estimated $191 annual operating cost per space, it can be expected that more than $500,000 in annual base operating expenses can be saved.

Exhibit B03-12. Parking Conversion Recommendations by Coordinated Parking Area

Coordinated Parking Area	Weekday		
	Existing or Planned Spaces	Shared Parking Strategy	Convert to Permeable
A	623	102	521
B	844	681	163
C	1,113	549	772
D	<89	89	0
E	<1,952	1,952	0
F	1,292	942	350
G	1,031	656	375
H	713	529	184
I	774	487	287
TOTAL	8,323	5,987	2,652

Non-Financial Benefits to Right-Sized Parking Assets

Coordinating parking across the most active portions of the base will accomplish more than reducing base costs. Less impervious surface leads to less stormwater infrastructure needing to be built and maintained. This greater amount of natural surface cover can absorb runoff rather than adding it to the cumulative stormwater system.

By reducing the number of planned parking spaces to be built and allowing 2,600 spaces to become permeable and eliminating the need to maintain these spaces each year, the amount of runoff that requires stormwater infrastructure would be reduced by an estimated 15.7 million gallons every year. Whereas this comes with significant cost savings on its own, the stormwater impacts to having more than 7 acres of land converted from an impervious state to a permeable one is an added benefit to the base overall.

A reduction in the base’s overall heat island effect is an additional direct (and positive) impact of having less parking surface. A heat island effect is created when asphalt reflects solar radiation back into the atmosphere; natural ground cover, on the other hand, absorbs the solar radiation and heat. The average temperature difference between asphalt and grass-covered area with no shade is 29 degrees Fahrenheit, with an increased average of 42 degrees with shade. This significant temperature difference will positively impact mission training and quality of life on base.

Life-Cycle Benefits

The 30-year life-cycle costs considering capital and operational comparisons between the two parking scenarios as modeled by ECONPAK is detailed in Exhibit B03-13.

Exhibit B03-13. 30-Year Life-Cycle Costs