

Chapter 6  
**RECOMMENDED DEVELOPMENT PLAN**  
Colorado Springs Airport

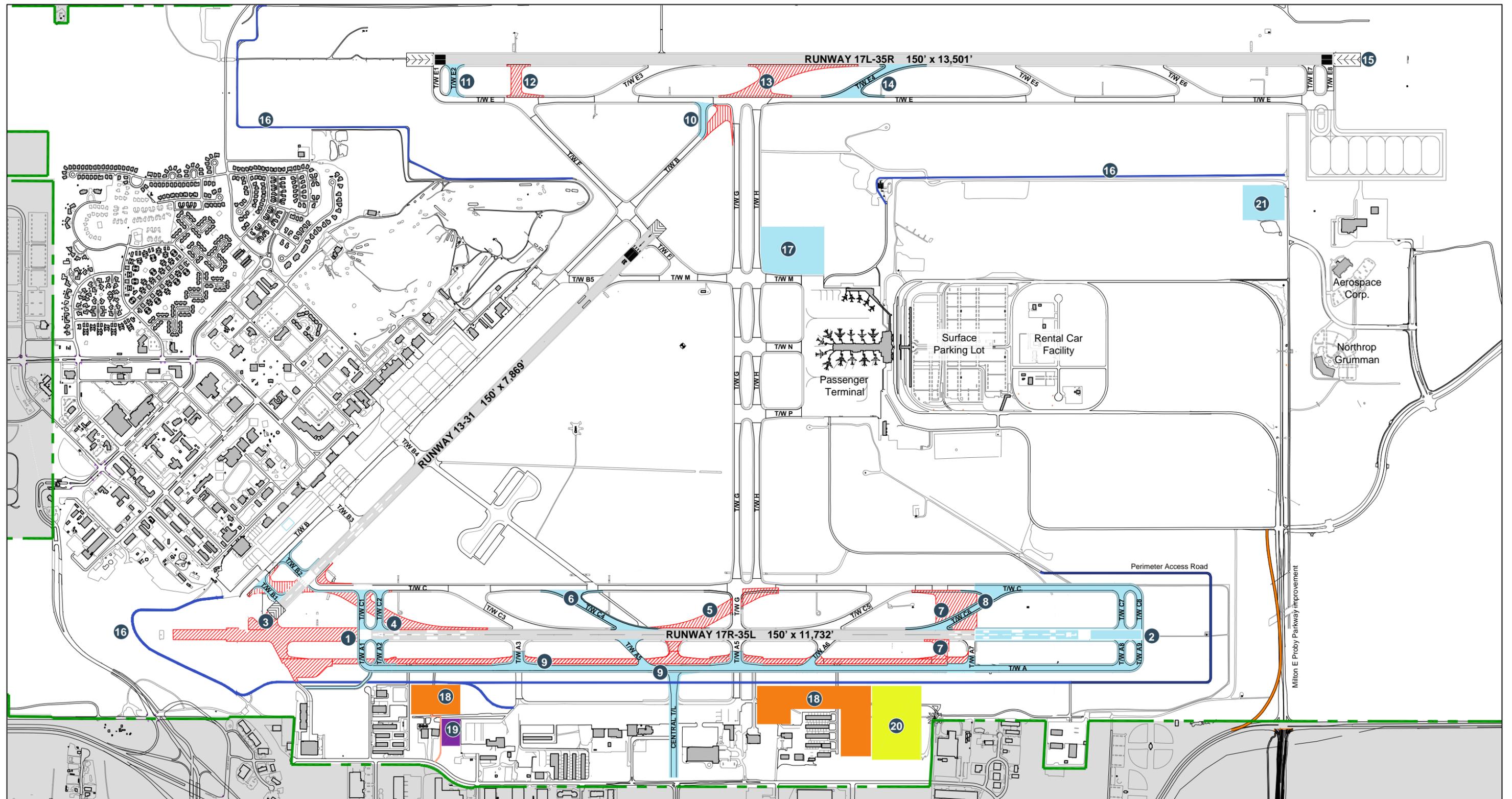
This chapter describes the Recommended Development Plan (RDP) for Colorado Springs Airport (the Airport). Included herein is a summary of projects included in the RDP and the cost estimates and phasing associated with the individual components of the RDP.

**RECOMMENDED PROJECTS**

The primary goal of the RDP is the elimination of the intersection of Runway ends 17R and 13 and associated taxiway improvements on the west airfield. These projects are founded upon Airport management's intent to reduce the risk of wrong runway departures and reduce identified "hot spots," while providing improved capability of Runway 17R-35L the secondary runway to Runway 17L-35R. With the net increase in length for Runway 17R-35L departures and the provision of an improved instrument landing system (ILS) for Runway 35R, the Airport improves its operational capability. Specifically, the improved ILS on Runway 35R would allow the primary runway to serve aircraft operations during Category II weather conditions, and the increased departure length of Runway 17R-35L provides near equivalent capability to primary Runway 17L-35R.

The individual components of the RDP are depicted on Figure 6-1, numbered 1-21 as described below.

1. **Shift the Runway 17R threshold to the south by 1,790 feet.** Runway 17R-35L is shown on Figure 6-1 shifted to the south by approximately 1,790 feet. This project provides separation from Runway 13-31, eliminating the runway intersection and reducing the risk of wrong runway departures. The project involves pavement removal, earthwork, and re-marking of the runway. This project would be completed in concert with projects 2 and 3.
2. **Extend Runway 35L to the south by 2,500 feet.** This project would involve extension of Runway 35L to the south approximately 2,500 feet. The net increase in departure length for Runway 17R-35L would be 710 feet. The net increase in arrival length for Runway 17R is 710 feet, and the net decrease for Runway 35L is 65 feet. The Runway 35L threshold is displaced by approximately 775 feet to provide a Runway Protection Zone (RPZ) clear of Milton E. Proby Parkway. The project involves construction of proposed pavement, significant earthwork, re-marking of the runway, and relocation of the approach lighting system for Runway 35L arrivals. This project would be completed in concert with projects 1 and 3.



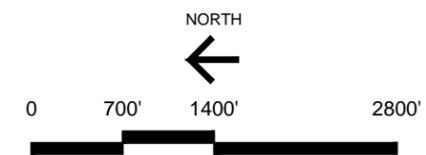
**LEGEND**

- Pavement to be demolished
- Recommended airfield project
- General aviation
- Air cargo
- MRO/hangars

**Recommended Projects**

- |  |   |  |
|--|---|--|
| <ul style="list-style-type: none"> <li>1 Runway 17R: shorten 1,790' and construct new taxiways</li> <li>2 Runway 35L: extend 2,500' and construct new taxiways</li> <li>3 Runway 13: shorten 400' and construct new taxiways</li> <li>4 Remove existing Taxiway C1</li> <li>5 Remove existing Taxiway C3</li> <li>6 Construct new Taxiway C4</li> <li>7 Remove existing Taxiways C6, C7, and A6</li> </ul> | <ul style="list-style-type: none"> <li>8 Construct new Taxiway C6</li> <li>9 Remove existing Taxiway A; realign Taxiway A to 500' from Runway 17R-35L; construct central taxiway</li> <li>10 Realign Taxiway B segment</li> <li>11 Construct new Taxiway E2</li> <li>12 Remove existing Taxiway E2</li> <li>13 Remove existing Taxiway E4</li> <li>14 Construct new Taxiway E4</li> </ul> | <ul style="list-style-type: none"> <li>15 Construct new instrument approach lighting system (ALSF-II)</li> <li>16 Pave vehicle service roads</li> <li>17 Construct deicing pad area</li> <li>18 General aviation expansion areas</li> <li>19 Air cargo expansion area</li> <li>20 MRO expansion area</li> <li>21 SRE facility</li> </ul> |
|--|---|--|

Source: Airport Layout Drawing - Jacobs Engineering, June 2013



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3. **Reduce length of Runway 13-31 by 400 feet.** Runway 13-31 would be shortened by approximately 400 feet. Shortening Runway 13-31, coupled with project 2, eliminates the runway intersection conflict. The Runway 13 threshold would be displaced by approximately 510 feet to provide a standard 1,000 foot Runway Safety Area and clear RPZ. The net decrease in departure length of Runway 13-31 would be 400 feet. The net decrease in arrival length of Runway 13 is 910 feet, and the net decrease in arrival length of Runway 31 is 400 feet. This project would be completed in concert with projects 1 and 2.
4. **Remove existing high-speed exit Taxiway C1.** This project would be completed in concert with project 1. The high-speed exit would no longer be located in the proper placement for Runway 35L arrivals as it is too near the relocated end of the runway. Further, the geometry of the existing taxiway would conflict with the proposed perpendicular exits.
5. **Remove existing high-speed exit Taxiway C3.** The location of this high-speed exit would no longer be properly placed given the shift of the Runway 17R threshold to the south. Moreover, the geometry associated with Taxiway C3 conflicts with the geometry of Taxiway G in its current configuration.
6. **Construct proposed high-speed exit Taxiway C4.** This project provides a proposed high-speed exit for Runway 35L arrivals. The location of this high-speed exit taxiway accounts for the shift of the Runway 35L threshold with the runway extension to the south.
7. **Remove existing exit Taxiways A6, C6, C7.** These taxiways currently serve the existing end of Runway 35L. With the extension to Runway 35L, these taxiways are no longer required but may remain in place. However, these exits must be removed to enable the construction of a proposed high-speed exit Taxiway C6 to serve Runway 17R arrivals. This project would be completed in concert with project 8.
8. **Construct proposed high-speed exit Taxiway C6.** This project provides a proposed high-speed exit for Runway 17R arrivals. The location of this high-speed exit accounts for the change in location of the Runway 17R threshold to the south. This project would be completed in concert with project 7.
9. **Remove and realign Taxiway A.** The realignment of Taxiway A would provide a parallel taxiway for Airplane Design Group (ADG) IV aircraft, with a centerline to centerline separation from Runway 17R-35L of 500 feet.

10. **Realign Taxiway B.** Taxiway B currently intersects Taxiways E, E4, and G creating the potential for pilot confusion. Taxiway B would be realigned to intersect Taxiway E at a 90 degree angle, eliminating potential confusion and providing improved functionality.
11. **Construct proposed bypass Taxiway E2.** This proposed taxiway would provide a bypass taxiway to serve aircraft needing to exit the Runway 17L end.
12. **Remove existing Taxiway E2.** Taxiway E2 would be better located nearer the end of Runway 17L. This project would be completed in concert with project 12.
13. **Remove existing high-speed exit Taxiway E4.** The geometry at the intersection of Taxiway E, E4, G, and H is complex, potentially causing pilot confusion. This taxiway would be replaced in a location approximately 1,400 feet south to reduce the potential for pilot confusion.
14. **Construct proposed high-speed exit Taxiway E4.** This project provides a proposed high-speed exit for Runway 35R arrivals. The location of this high-speed exit accounts for the removal of existing Taxiway E4. This project would be completed in concert with project 13.
15. **Provide Runway 35R with an improved Instrument Landing System.** The approach to Runway 35R would be enhanced by the addition of a High Intensity Approach Lighting System with Sequenced Flashing Lights (ALSF-2). The ALSF-2 would provide Category II capability for arrivals in inclement weather conditions.
16. **Pave perimeter vehicle service roads.** The perimeter vehicle service roads require realignment around the ends of Runway 17R-35L. In addition, the perimeter road is not paved in its entirety. The FAA Runway Safety Action Team has expressed the need for the perimeter road to be paved to reduce the number of vehicles using taxiways and runways to move about the Airport.
17. **Construct deicing pad.** This project would provide additional space for deicing aircraft nearer their point of departure, primary Runway 17L-35R.
18. **General aviation expansion areas.** These parcels of land were identified in the master planning process as being ideal for general aviation expansion as the need arises.

19. **Air cargo expansion area.** This parcel of land was identified in the master planning process as being ideal for air cargo expansion as the need arises. The project would likely involve expansion of the existing cargo apron, currently in use by FedEx, to the north, allowing for one additional aircraft parking position.
20. **Maintenance, repair, and overhaul (MRO) expansion area.** This parcel of land was identified in the master planning process as being ideal for MRO expansion should the need arise. The parcel of land provides good access to the airfield, is consistent with the surrounding land use on the west side of Taxiway A, and has good landside access as well.
21. **Snow removal equipment (SRE) facility.** This parcel of land was identified in the master planning process as being ideal for an SRE storage facility. The goal of constructing additional SRE storage is to achieve increased efficiency for snow removal operations that occur on the east side of the Airport. Due to its length and the fact that Runway 17L-35R is equipped with an ILS on both ends, it is most capable of handling aircraft during inclement weather. However, the existing SRE facility is located on the southwest side of the Airport and results in time-consuming preparation and travel to primary Runway 17L-35R.

## **IMPLEMENTATION PLAN**

The following provides the estimated costs and potential phasing for the RDP along with the Airport's overall capital improvement program.

### **Project Phasing**

Table 6-1 also indicates in which of the four phases the individual project component is included; Figure 6-2 presents a graphical depiction of the RDP showing its four phases.

Phase 1, including projects 1-4, involves the improvements necessary to deconflict the intersection of Runway ends 17R and 13. Each of these projects is located on the west side of the airfield. Phase 1 also includes projects 15 and 16 which are of immediate interest to Airport management and may be implemented independently of projects 1-4. These projects have independent utility; in the case of project 15 the Airport would improve its capability to accommodate landings during Category II weather conditions. In the case of project 16, the Airport would reduce runway crossings by maintenance and operations vehicles by providing paved service roads that reduce the need to traverse taxiways and runways.

Phase 2, including projects 6 through 8, could be completed in concert with Phase 1; however, they are not necessary to implement the runway deconflicting. This

phasing scheme allows airport management the flexibility to decrease the upfront cost of implementation should it be prudent to do so.

Phase 3 includes projects 10 through 14 and is primarily focused on improvements to the east side of the airfield. These projects could be completed in concert with major maintenance to Runway 17L-35R or its parallel Taxiway E.

Phase 4, including projects 17-21, would be implemented by the Airport on an opportunistic basis and as the need arises. It may be prudent to implement one of these projects ahead of the other phases, depending on the need and availability of funding. Further, these projects need not be completed and would not likely be completed as part of a package. Each project has independent utility, and their implementation schedule should be revisited on an annual basis by Airport management as part of the routine review of the RDP. Phase 4 also includes project 9, which involves the realignment and reconstruction of parallel Taxiway A. This project would likely be undertaken when Taxiway A pavement would be scheduled for reconstruction.

### **Capital Improvement Program**

The Airport has an ongoing capital improvement program (CIP) which assigns projects to a given year, currently looking out nine years to 2021. While the majority of the implementation of the RDP is anticipated to be beyond the next five years, the Airport is planning to undertake a number of projects to enable the implementation of the master plan recommendations, beginning in 2018. Projects in the CIP related to implementation of the RDP include:

- Environmental Assessment for master plan projects 1-5, scheduled for 2018;
- Design for projects 1-5, scheduled for 2019;
- Construction for projects 1-5, scheduled for 2020 and 2021.

Within the next five years (2014-2018), the Airport intends to spend approximately 65.1 million on a variety of projects, including major pavement rehabilitation projects for Taxiways E, G, and H and the terminal apron. The Airport's CIP is summarized in Table 6-1.

Notably, the CIP for the first five years is the most well-defined. Beyond five years, the CIP includes order of magnitude cost estimates and is subject to continual refinement of priorities and schedule. The CIP for years 2019-2021 will be the subject of continual refinement as the Airport consults with the FAA and plans for the implementation of the RDP.

Table 6-1  
**CAPITAL IMPROVEMENT PROGRAM**  
Colorado Springs Airport

Year	Project description	Cost (millions)
2014	Rehabilitation of Taxiways E, G and H (Phase V)	\$10.4
	Taxiway A partial rehabilitation	3.3
	Other projects	0.2
	<b>Subtotal</b>	<b>\$13.9</b>
2015	Rehabilitation of terminal apron and trench drain system	\$11.0
	Other projects	1.1
	<b>Subtotal</b>	<b>\$12.1</b>
2016	Rehabilitation of Taxiways C, G and terminal connectors (Phase I)	\$ 11.0
	Other projects	1.0
	<b>Subtotal</b>	<b>\$12.0</b>
2017	Rehabilitation of Taxiways C, G and terminal connectors (Phase II)	\$ 13.2
	Other projects	1.1
	<b>Subtotal</b>	<b>\$14.3</b>
2018	Rehabilitation of Taxiways C, G and terminal connectors (Phase III)	\$ 10.4
	Environmental Assessment for master plan projects 1-5	1.1
	Other projects	1.2
	<b>Subtotal</b>	<b>\$12.7</b>
2019	Rehabilitation of Taxiways C, G and terminal connectors (Phase IV)	\$ 10.4
	Design for master plan projects 1-5	1.1
	Other projects	1.2
	<b>Subtotal</b>	<b>\$12.7</b>
2020	Construction of master plan projects 1, 3, 5	\$ 12.1
	Other projects	1.2
	<b>Subtotal</b>	<b>\$12.3</b>
2021	Construction of master plan project 2 (Phase 1)	<b>\$ 11.0</b>
	<b>TOTAL</b>	<b>\$101.0</b>

Source: Airport records and master plan cost estimates, July 2013.

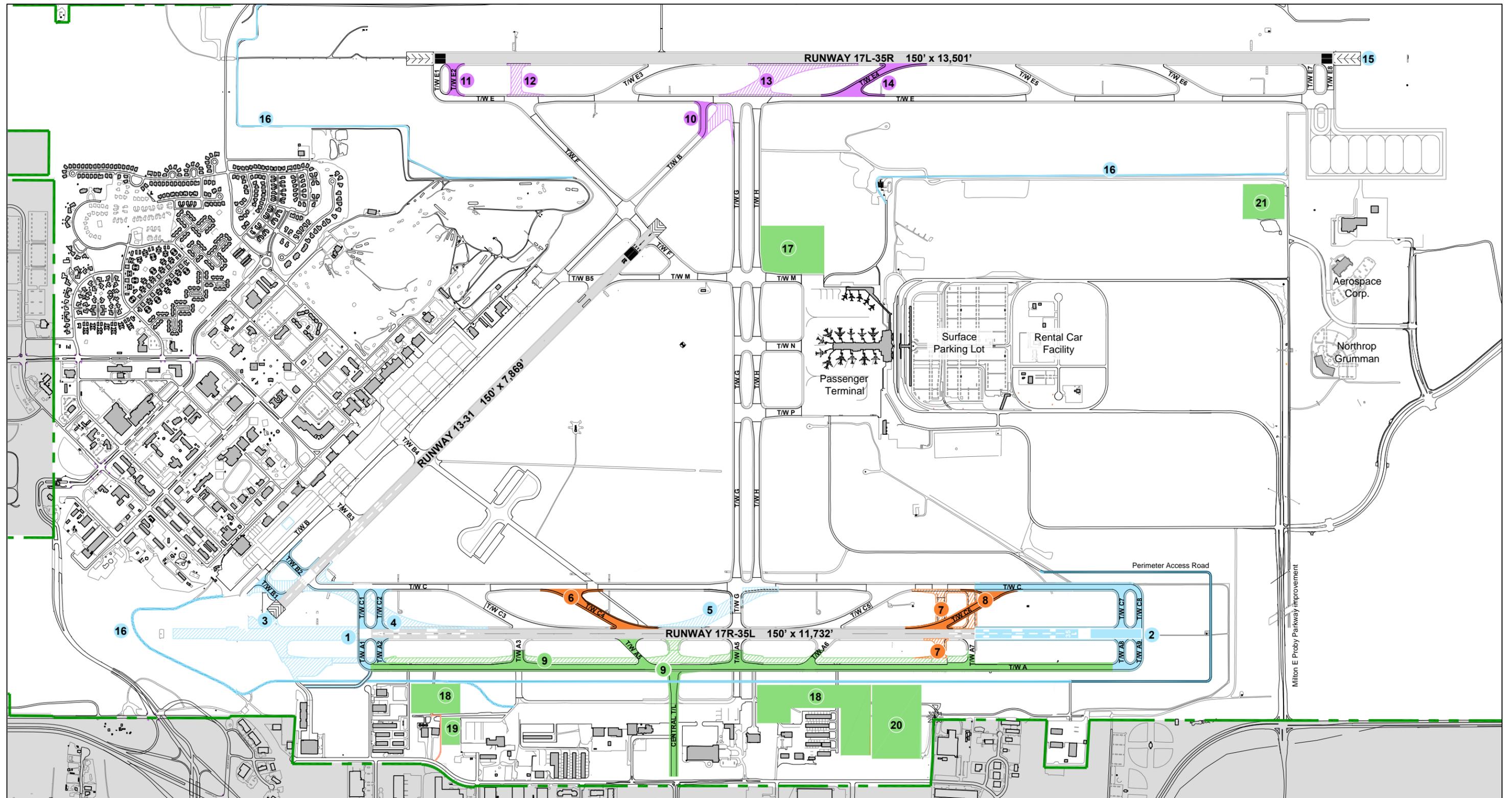
## **Anticipated Funding Sources**

A combination of traditional airport funding sources and financing mechanisms including federal Airport Improvement Program (AIP) grants, airport revenue bonds, passenger facility charges, state grants, and cash generated from Airport operations could be used to fund the RDP. The majority of funding would likely come in the form of AIP discretionary grants, which are awarded to airports on the basis of priority and available funding.

*Future development at the Airport shall continue to be self-funded by users of the airport and aviation system; no local sales or property taxes will be used to fund Airport capital improvements.*

## **Cost Estimates**

Project cost estimates for the RDP are summarized in Table 6-2. In total, the plan is estimated to cost approximately \$114.5 million. Phases 1 and 2, which total \$80.6 include all of the west airfield improvements excluding the realignment of Taxiway A. Detailed information supporting these cost estimates is located in Appendix F.



**LEGEND**

- PHASE 1 (Projects 1-5, 15, 16)
- PHASE 2 (Projects 6-8)
- PHASE 3 (Projects 10-14)
- PHASE 4 (Project 9, 17-21)

**Recommended Projects**

- |   |  |   |
|---|--|---|
| <ul style="list-style-type: none"> <li><span style="display: inline-block; width: 10px; height: 10px; background-color: lightblue; border: 1px solid black; margin-right: 5px;"></span> 1 Runway 17R: shorten 1,790' and construct new taxiways</li> <li><span style="display: inline-block; width: 10px; height: 10px; background-color: lightblue; border: 1px solid black; margin-right: 5px;"></span> 2 Runway 35L: extend 2,500' and construct new taxiways</li> <li><span style="display: inline-block; width: 10px; height: 10px; background-color: lightblue; border: 1px solid black; margin-right: 5px;"></span> 3 Runway 13: shorten 400' and construct new taxiways</li> <li><span style="display: inline-block; width: 10px; height: 10px; background-color: lightblue; border: 1px solid black; margin-right: 5px;"></span> 4 Remove existing Taxiway C1</li> <li><span style="display: inline-block; width: 10px; height: 10px; background-color: lightblue; border: 1px solid black; margin-right: 5px;"></span> 5 Remove existing Taxiway C3</li> <li><span style="display: inline-block; width: 10px; height: 10px; background-color: orange; border: 1px solid black; margin-right: 5px;"></span> 6 Construct new Taxiway C4</li> <li><span style="display: inline-block; width: 10px; height: 10px; background-color: orange; border: 1px solid black; margin-right: 5px;"></span> 7 Remove existing Taxiways C6, C7, and A6</li> </ul> | <ul style="list-style-type: none"> <li><span style="display: inline-block; width: 10px; height: 10px; background-color: purple; border: 1px solid black; margin-right: 5px;"></span> 8 Construct new Taxiway C6</li> <li><span style="display: inline-block; width: 10px; height: 10px; background-color: green; border: 1px solid black; margin-right: 5px;"></span> 9 Remove existing Taxiway A; realign Taxiway A to 500' from Runway 17R-35L; construct central taxiway</li> <li><span style="display: inline-block; width: 10px; height: 10px; background-color: purple; border: 1px solid black; margin-right: 5px;"></span> 10 Realign Taxiway B segment</li> <li><span style="display: inline-block; width: 10px; height: 10px; background-color: purple; border: 1px solid black; margin-right: 5px;"></span> 11 Construct new Taxiway E2</li> <li><span style="display: inline-block; width: 10px; height: 10px; background-color: purple; border: 1px solid black; margin-right: 5px;"></span> 12 Remove existing Taxiway E2</li> <li><span style="display: inline-block; width: 10px; height: 10px; background-color: purple; border: 1px solid black; margin-right: 5px;"></span> 13 Remove existing Taxiway E4</li> <li><span style="display: inline-block; width: 10px; height: 10px; background-color: purple; border: 1px solid black; margin-right: 5px;"></span> 14 Construct new Taxiway E4</li> </ul> | <ul style="list-style-type: none"> <li><span style="display: inline-block; width: 10px; height: 10px; background-color: lightblue; border: 1px solid black; margin-right: 5px;"></span> 15 Construct new instrument approach lighting system (ALSF-II)</li> <li><span style="display: inline-block; width: 10px; height: 10px; background-color: lightblue; border: 1px solid black; margin-right: 5px;"></span> 16 Pave vehicle service roads</li> <li><span style="display: inline-block; width: 10px; height: 10px; background-color: green; border: 1px solid black; margin-right: 5px;"></span> 17 Construct deicing pad area</li> <li><span style="display: inline-block; width: 10px; height: 10px; background-color: green; border: 1px solid black; margin-right: 5px;"></span> 18 General aviation expansion areas</li> <li><span style="display: inline-block; width: 10px; height: 10px; background-color: green; border: 1px solid black; margin-right: 5px;"></span> 19 Air cargo expansion area</li> <li><span style="display: inline-block; width: 10px; height: 10px; background-color: green; border: 1px solid black; margin-right: 5px;"></span> 20 MRO expansion area</li> <li><span style="display: inline-block; width: 10px; height: 10px; background-color: green; border: 1px solid black; margin-right: 5px;"></span> 21 SRE facility</li> </ul> |
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Source: Airport Layout Drawing - Jacobs Engineering, June 2013

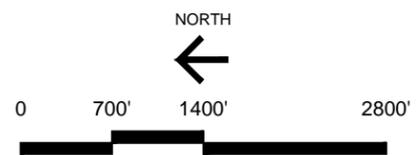


Figure 6-2  
**PHASING PLAN**  
 Master Plan Update  
 Colorado Springs Airport  
 July 2013

Table 6-2  
**RECOMMENDED DEVELOPMENT PLAN COST ESTIMATES**  
Colorado Springs Airport

Project no. (a)	Description	Cost (b)
<b>PHASE 1</b>		
1	Shift Runway 17R-35L 1,790 feet south; construct Taxiways A1, A2, C1, and C2	\$ 8.5
2	Construct 2,500 foot extension to Runway 35L; construct Taxiways A8, A9, C7, and C8	43.8
3	Shorten Runway 13-31 by 400 feet; construct Taxiways B1 and B2; displace Runway 13 threshold	3.6
4	Remove existing high-speed exit Taxiway C1	0.8
5	Remove existing Taxiway C3	1.1
15	Construct approach lighting system (ALSF-II) for Runway 35R arrivals	3.3
16	Pave vehicle service roads around Runway 17R-35L; from PAFB to A/DACG facility; from A/DACG to fuel farm.	6.1
	<b>Subtotal</b>	<b>\$67.2</b>
<b>PHASE 2</b>		
6	Construct proposed high-speed exit Taxiway C4	\$6.7
7	Remove existing Taxiways A6, C6, and C7	0.6
8	Construct proposed high-speed exit Taxiway C6	6.1
	<b>Subtotal</b>	<b>\$13.4</b>
<b>PHASE 3</b>		
10	Realign Taxiway B at intersection with Taxiway E	\$2.3
11	Construct Taxiway E2	2.2
12	Remove existing Taxiway E2	0.8
13	Remove existing Taxiway E4	2.2
14	Construct proposed high-speed exit Taxiway E4	5.1
	<b>Subtotal</b>	<b>\$12.6</b>
<b>PHASE 4 (c)</b>		
9	Realign Taxiway A to provide 500 foot separation from Runway 17R-35L	\$21.3
	<b>Subtotal</b>	<b>\$21.3</b>
<b>GRAND TOTAL</b>	Total for Phases 1 through 4 (excluding projects 17-21)	<b>\$114.5</b>

(a) Corresponds to numbering Figure 6-2, Phasing Plan.

(b) Cost in millions of dollars.

(c) Projects 17-21 were not included as the cost would be dependent upon the scope of the development which is unknown at this time.

Source: Cost estimates provided by Jacobs Engineering, July 2013.