Green Evaluation

Denver Airport System Subordinate Revenue Bonds Series 2018A And 2018B

Transaction Overview
The Department of Aviation of the City and County of Denver, Colorado (Denver) owns and operates the Denver International Airport (DEN). Denver is issuing $2.3 billion in airport system subordinate revenue bonds maturing in December 2048. A portion of the proceeds of the series 2018A and 2018B bonds will be used for capital investments under the 2018-2022 Capital Improvement Plan (CIP), including to expand and rehabilitate the airport’s concourses and Great Hall, as well as to improve other facilities. While other portions of the CIP will have environmental impacts and may be within the scope of our analytical approach, per the issuer’s request, our Green Evaluation’s exclusive focus is the projects related to the expansions of Concourses A, B, and C, which are being built to LEED Gold standards. For this reason, we are only evaluating $921.75 million (or 41%) of the proceeds of the series 2018A, 2018B, and 2018C issuance.

Green Evaluation Overview

Transaction’s Transparency
- Use of proceeds reporting
- Reporting comprehensiveness

Transaction’s Governance
- Management of proceeds
- Impact assessment structure

Mitigation
Sector → Net Benefit Ranking → Hierarchy Adjustments

Green Buildings
New Build - commercial
Significant decarbonization in sectors already aligned with a green economy

Adaptation
NA

Entity: Denver International Airport
Subsector: N.A.
Location (HQ): United States
Financing value: $2,275 million
Amount evaluated: 41%
Evaluation date: Aug. 6, 2018
Contact: Erin Boeke Burke +1-212-438-1515 erin.boeke-burke@spglobal.com

Overall Score:
E1/87

Weighted aggregate of three
(Transparency + Governance + Mitigation)
Project Description

The DEN 2018-2022 CIP totals approximately $3.5 billion in projects, including rehabilitating and replacing airfields, roadways, terminal complex buildings, and other assets. Approximately $1.3 billion of the CIP is dedicated to expanding Concourses A-West, B-East, B-West, and C-East (part of the gate expansion project), including approximately $922 million of the series 2018 bonds. The gate expansion Project includes the design and construction of new gates and associated apron, airfield, and roadway improvements, as well as an increase in airline and concessions space, including outdoor space, on each concourse. In total, 39 new gates and supporting infrastructure are anticipated to be operational by spring 2021, with Concourse B’s four west-side gates operational by 2020.

Under Denver Executive Order No. 123, all new city buildings and major renovations must achieve LEED Gold certification and adhere to the U.S. Environmental Protection Agency’s Energy Star program standards and other applicable best management practices for sustainability and energy efficiency. The expansion contracts clearly state the LEED goal per E.O. 123 and the city’s sustainability program guidelines. As each project moves forward, DEN presents to multiple public forums before contract approval and construction starts. Additionally, DEN provides regular updates to the City Council on CIP progress, including financing. Future updates will discuss the application of bond proceeds, including the distinction of proceeds applied to green building projects as opposed to other functions of the airport or other projects in the CIP. Future updates will also detail how the project is tracking on a LEED certifications scorecard; and other environmental benefits.

The DEN Concourse C-West expansion was completed to LEED Gold standards in 2015, achieving environmental benefits including a 16% energy use reduction, and 20% water use reduction, compared to the baseline; diverting 92% of on-site construction waste from landfills and offsetting 100% of the energy cost for the first three years with renewable energy sources. Based on our review of the preliminary LEED scorecards and our discussions with management, we estimate Concourses A-West, B-East, B-West, and C-East will yield comparable benefits. Therefore, we have assessed the other concourse expansion projects in the gate expansion project (not including runways and other non-building assets) as new construction under our green building hierarchy.

Scoring Summary

The allocated proceeds evaluated in this transaction achieve an overall Green Evaluation score of E1/87, which is the strongest Green Evaluation score on our scale of E1 (highest) to E4 (lowest). We determined this score by taking a weighted average of the transaction’s solid Governance (76) and strong Transparency (79) assessments and its excellent Mitigation score (93). In our view, the expected reductions in water and energy usage compared to building projects not designed and constructed according to similar environmental standards, or that are located in areas with less carbon-intensive electric grids, place this project toward the top end of scores for green buildings.

Rationale

- We anticipate that the Concourses A-West, B-East, B-West, and C-East expansions will meet LEED Gold standards post-construction. The allocated proceeds evaluated in this financing receive a relatively excellent Net Benefit Ranking due to the high carbon-intensity of the state-level grid in Colorado. The relatively higher baseline carbon intensity of the state’s electric grid is a key factor influencing the Net Benefit Ranking, and contributes to driving this particular sub-score higher than in other green building projects.

- The above-average Governance score reflects the intent to track environmental impact of the expansion project required for LEED certification and the framework to manage proceeds.

- DEN’s commitment to track and disclose the use of funds for the expansion project and for environmentally beneficial aspects of the CIP, as well as the environmental impacts of this project as well as the airport as a whole, contribute to the strong Transparency score.

Key Strengths And Weaknesses

The 2018 bond proceeds include $922 million for the terminal buildings associated with the concourse expansions; this amount is the only portion of the issuance included in our Green Evaluation. The use of LEED as a design and construction standard and the resulting environmental benefit over the life of the complex are key assumptions to our evaluation. Denver has established a LEED Gold requirement for major rehabilitations and new construction, and the LEED Gold goal is explicitly referenced in the construction contracts for the concourse expansions along with DEN’s other sustainability guidelines.

Based on information reported by management, as well as our review of the preliminary LEED scorecards, the wide range of environmental strategies— including daylighting, high-efficiency lighting, insulation, dynamic glass, and high-efficiency HVAC and motors—will lead to electricity savings of 22%-36% in each concourse expansion, and natural gas savings of 17%-48%, compared to a code-compliant baseline design. These benefits are within the scope of our green evaluation methodology. The design will also reduce indoor and outdoor water use, and will reduce the heat-island effect of the airport.

Our evaluation of green building projects considers two primary environmental key performance indicators for new buildings within the specifications of globally accepted green building certifications (i.e., LEED): avoided carbon emissions resulting from relatively higher degrees of energy efficiency, and to a lesser extent, reduced water usage. The expected avoided carbon emissions accruing from the concourse expansion project carry added significance in our evaluation, given the high degree of carbon intensity in the electric grid in Colorado. According to the U.S. Energy Information Administration, nearly 55% of electricity generation in Colorado in 2016 came from coal. This comparatively high carbon-intensity is a factor in the very strong Mitigation score.

In addition to the Denver E.O. 123, DEN has additional sustainability policies that promote conservation and environmentally conscious building practices.
We view this comprehensive framework for integrating environmental sustainability into capital construction favorably, and it helps support the solid Governance score. DEN has established a unique project ID to track the amounts expended on the concourse expansion projects, which we believe improves governance of these funds. DEN management reports it is developing a separate subaccount for proceeds evaluated as green construction funds; however, we have not factored in this future enhancement to the Governance score for the series 2018 issuance.

Our Governance score also reflects the existing and planned tracking of energy and water savings for the economic life of each concourse expansion building on a project-level basis. DEN is already tracking electricity, natural gas, and water use for internal purposes through software tools including EnergyCAP and now PowerBI. Management also uses the data to report on greenhouse gas emissions as part of DEN’s contributions to the greater Denver greenhouse gas reduction goals and the Airport Carbon Accreditation process as part of the LEED certification process, and for the energy design assistance program from Xcel Energy.

The financing’s above-average Transparency score is a result of public disclosure throughout the project development and construction process, as well as on clear Denver-wide and DEN-wide environmental policies. As each project moves forward, DEN presents to multiple public forums such as the Business Committee, Mayor’s Council, and City Council. Management has committed to provide regular updates to the City Council to discuss the CIP’s progress, including the final contract costs and environmental benefits aggregated at the concourse-level. Reported environmental benefits will include electricity, natural gas, and water savings compared to code-compliant baselines, as well as how the projects are tracking on their LEED scorecards.

Management has represented to S&P Global Ratings its plans to disclose the basis for the baseline and projected energy consumption and savings calculations for the concourse expansions, as well as the impact of the projects on airport carbon emissions as a part of DEN’s greenhouse gas reporting.

### Sector level scores

<table>
<thead>
<tr>
<th>Sector</th>
<th>Location</th>
<th>Technology</th>
<th>Use of Proceeds (US$mil.)</th>
<th>Use of Proceeds treatment</th>
<th>Net Benefit Ranking</th>
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</thead>
<tbody>
<tr>
<td>Green Buildings</td>
<td>Colorado, U.S.A.</td>
<td>New Build - Commercial</td>
<td>921.75</td>
<td>Estimated</td>
<td>99</td>
</tr>
</tbody>
</table>

921.75
## Carbon

### Green Evaluation Process

<table>
<thead>
<tr>
<th>Technology</th>
<th>Baseline Carbon Intensity</th>
<th>Net Benefit Ranking</th>
<th>Carbon Hierarchy Adjustment</th>
<th>Environmental Impact Score</th>
<th>Proceeds (US$m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wind power</td>
<td>High</td>
<td>Low</td>
<td>Systemic decarbonization</td>
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<tr>
<td>Solar power</td>
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<td>Small hydro</td>
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<tr>
<td>Large hydro (excluding tropical areas)</td>
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<tr>
<td>Energy management and control</td>
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<td>Green transport without fossil fuel combustion</td>
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<td><strong>Green buildings – new build</strong></td>
<td><strong>99</strong></td>
<td></td>
<td><strong>Significant decarbonization in sectors already aligned with a green economy</strong></td>
<td>93</td>
<td>921.75</td>
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<td>Energy efficient projects (industrial and appliance efficiencies)</td>
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<td>Green transport with fossil fuel combustion</td>
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<td>Green buildings refurbishment</td>
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<td>Nuclear</td>
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<td>Large hydro in tropical areas</td>
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<td>Coal to natural gas</td>
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<td>Cleaner fuel production</td>
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<td>Cleaner use of coal</td>
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### Scores

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<tr>
<th>Score</th>
<th>Description</th>
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<tr>
<td>79</td>
<td>Transparency</td>
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<tr>
<td>76</td>
<td>Governance</td>
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<td>93</td>
<td>Mitigation</td>
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<td>87</td>
<td>Overall Score</td>
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### Weighted Aggregate Scores

- Transparency: 79
- Governance: 76
- Mitigation: 93

Overall Score: E1/87

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This product is not a credit rating.
Our Green Evaluation Approach

Weighted aggregate of three:

- Transparency
- Governance
- Mitigation or Adaptation

= Green Evaluation

Common approach used amongst opinion providers:

- Transparency
  - Use of proceeds reporting
  - Reporting comprehensiveness

- Governance
  - Management of proceeds
  - Impact Assessment Structure

Unique to S&P Global Ratings:

- Mitigation
  - Buildings, industrial efficiencies, energy infrastructure, transport, and water

- Adaptation
  - Resilience capex such as flood defenses, asset protection etc.

- Net Benefit Ranking
  - eKPI's: Carbon, Waste, Water Use

- Cost Benefit Ranking
  - Resilience benefit ratio: Estimate of reduction in damages if event occurs

- Hierarchy Applied

- Environmental Impact

- Resilience Level

- Mitigation Score

- Adaptation Score

Final Green Evaluation (E1-E4 or R1-R4)

eKPI – Environmental Key Performance Indicator
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