University of North Dakota

ROPA+ Data Review Presentation

January 2017

Sophie Mason

Tiffany Smith
What We Do

Data, software and expertise for all phases of The Building Lifecycle

GORDIAN®
for Operations

GORDIAN®
for Planning

GORDIAN®
for Construction

GORDIAN®
for Design

GORDIAN®
for Procurement
Who Partners with Sightlines?

Robust membership includes colleges, universities, consortiums and state systems serving the Nation’s Leading Institutions:

- 70% of the Top 20 Colleges*
- 75% of the Top 20 Universities*
- 34 Flagship State Universities
- 14 of the 14 Big 10 Institutions
- 9 of the 12 Ivy Plus Institutions

* U.S. News 2016 Rankings

Sightlines is proud to announce that:

- 450 colleges and universities are Sightlines clients including over 325 ROPA members.
- Consistently over 90% member retention rate
- We have clients in over 40 states, the District of Columbia and four Canadian provinces
- More than 125 new institutions became Sightlines members since 2013

Serving the Nation’s Leading Institutions:

- 70% of the Top 20 Colleges*
- 75% of the Top 20 Universities*
- 34 Flagship State Universities
- 14 of the 14 Big 10 Institutions
- 9 of the 12 Ivy Plus Institutions

Sightlines advises state systems in:

- Alaska
- California
- Florida
- Hawaii
- Maine
- Massachusetts
- Minnesota
- Mississippi
- Missouri
- Nebraska
- New Hampshire
- New Jersey
- Pennsylvania
- Texas

* U.S. News 2016 Rankings
Comprehensive Facilities Intelligence Solutions

- **FACILITIES BENCHMARKING & ANALYSIS**: Take control of your facilities and make the case for change without the guesswork
  - 364

- **FACILITIES ASSESSMENT & PLANNING**: Plan and execute capital investment plans that are inclusive, credible, flexible, affordable and sustainable
  - 126

- **SPACE UTILIZATION**: Ensure your space is working up to its full potential
  - 48

- **SUSTAINABILITY SOLUTIONS**: Measure and improve environmental stewardship
  - 28

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A Vocabulary for Measurement
The Return on Physical Assets – ROPA℠

The annual investment needed to ensure buildings will properly perform and reach their useful life
“Keep-Up Costs”

The accumulation of repair and modernization needs and the definition of resource capacity to correct them
“Catch-Up Costs”

The effectiveness of the facilities operating budget, staffing, supervision, and energy management

The measure of service process, the maintenance quality of space and systems, and the customers opinion of service delivery

Annual Stewardship
Asset Reinvestment
Operational Effectiveness
Service

Asset Value Change
Operations Success
# ROPA Peers

<table>
<thead>
<tr>
<th>ROPA Peers</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Colorado State University</td>
<td>Fort Collins, CO</td>
</tr>
<tr>
<td>University of Missouri - Kansas City</td>
<td>Kansas City, MO</td>
</tr>
<tr>
<td>University of Missouri - St. Louis</td>
<td>St. Louis, MO</td>
</tr>
<tr>
<td>University of New Hampshire</td>
<td>Durham, NH</td>
</tr>
<tr>
<td>University of Oregon *</td>
<td>Eugene, OR</td>
</tr>
<tr>
<td>University of Southern Mississippi</td>
<td>Hattiesburg, MS</td>
</tr>
<tr>
<td>Washington State University</td>
<td>Pullman, WA</td>
</tr>
</tbody>
</table>

## Comparative Considerations

Size, technical complexity, age, density, and geographic setting, are all factors included in the selection of peer institutions.

*Flagship*
Flagship Peers

UND will also be compared to 27 Flagship institutions

<table>
<thead>
<tr>
<th>Flagship Peers</th>
<th>Campus Size</th>
<th>Student FTE's</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indiana University – Bloomington</td>
<td>9,650,223</td>
<td>49,695</td>
</tr>
<tr>
<td>Louisiana State University</td>
<td>6,466,964</td>
<td>28,578</td>
</tr>
<tr>
<td>New Mexico State University</td>
<td>3,259,706</td>
<td>13,113</td>
</tr>
<tr>
<td>The Ohio State University</td>
<td>16,729,657</td>
<td>55,650</td>
</tr>
<tr>
<td>The Pennsylvania State University</td>
<td>12,464,241</td>
<td>45,661</td>
</tr>
<tr>
<td>The University of Alabama at Birmingham</td>
<td>9,102,935</td>
<td>15,073</td>
</tr>
<tr>
<td>The University of Arizona</td>
<td>7,227,706</td>
<td>42,749</td>
</tr>
<tr>
<td>The University of Maine</td>
<td>3,058,418</td>
<td>9,594</td>
</tr>
<tr>
<td>The University of Mississippi</td>
<td>4,132,000</td>
<td>18,242</td>
</tr>
<tr>
<td>The University of Tennessee - Knoxville</td>
<td>7,201,369</td>
<td>26,184</td>
</tr>
<tr>
<td>University of Alaska Fairbanks</td>
<td>3,193,757</td>
<td>4,373</td>
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<tr>
<td>University of Arkansas</td>
<td>4,059,959</td>
<td>27,194</td>
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<tr>
<td>University of Connecticut</td>
<td>7,135,310</td>
<td>24,183</td>
</tr>
<tr>
<td>University of Georgia</td>
<td>10,161,743</td>
<td>35,165</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Flagship Peers</th>
<th>Campus Size</th>
<th>Student FTE's</th>
</tr>
</thead>
<tbody>
<tr>
<td>University of Illinois - Urbana/Champaign</td>
<td>12,750,448</td>
<td>45,842</td>
</tr>
<tr>
<td>University of Iowa</td>
<td>8,647,359</td>
<td>29,479</td>
</tr>
<tr>
<td>University of Maryland - College Park</td>
<td>8,261,495</td>
<td>35,990</td>
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<tr>
<td>University of Massachusetts Amherst</td>
<td>8,093,260</td>
<td>24,906</td>
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<tr>
<td>University of Minnesota - Twin Cities</td>
<td>16,629,192</td>
<td>47,372</td>
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<tr>
<td>University of Missouri - Columbia</td>
<td>6,931,405</td>
<td>27,643</td>
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<tr>
<td>University of New Hampshire</td>
<td>2,937,249</td>
<td>14,197</td>
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<tr>
<td>University of Oregon</td>
<td>4,177,442</td>
<td>22,629</td>
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<tr>
<td>University of Rhode Island</td>
<td>2,274,406</td>
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<td>University of Utah</td>
<td>6,658,711</td>
<td>25,776</td>
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<td>University of Vermont</td>
<td>5,436,267</td>
<td>11,593</td>
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<td>University of Washington</td>
<td>13,546,717</td>
<td>46,712</td>
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<tr>
<td>University of Wisconsin - Madison</td>
<td>17,018,155</td>
<td>39,188</td>
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</table>
Space Profile
UND Has Lower Density than Peers and Flagship Schools

**Density Factor**

<table>
<thead>
<tr>
<th></th>
<th>Users / 100,000 GSF</th>
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<tbody>
<tr>
<td>A</td>
<td>303</td>
</tr>
<tr>
<td>B</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td></td>
</tr>
<tr>
<td>D</td>
<td></td>
</tr>
<tr>
<td>E</td>
<td></td>
</tr>
<tr>
<td>F</td>
<td></td>
</tr>
<tr>
<td>G</td>
<td></td>
</tr>
</tbody>
</table>

**Flagship Average**

**Peer Average**

**Wear and Tear of Space**

**Custodial Staffing Levels**

**Impacts**

**Maintenance Staffing Levels**

**Cleanliness Scores**

**Database Distribution: Density Factor**

- **UND FY17**
- **Peer Average**
- **Flagship Average**
Information on Demographics FTEs

Current Source Data: UND Institutional Research and Human Resources.

Student FTEs come from the Factbook, and are calculated based on the respective fiscal year’s Fall term student credit hours; for example, fiscal year 2017 will reflect Fall 2016.

Faculty FTEs also came from Institutional Research, using the respective fiscal year’s Fall term headcounts; full-time faculty were assumed to be 1 while part-time faculty were assumed to be 0.5 FTEs.

Human Resources (HR) provided information on total employee FTE including both faculty and staff. We calculated staff FTEs by subtracting faculty FTEs from the total employee numbers.

HR's FTE data currently does not include FY17, so we have pulled forward FY16 staff FTE for now. We have reached out directly to HR to provide & confirm the staff FTE number and we will adjust accordingly if they provide different information.

Sources:
(Students) https://und.edu/research/institutional-research/_files/docs/factbook/2016/s3-campusenrollment.pdf
(Faculty) http://und.edu/research/institutional-research/_files/docs/dashboards/faculty.pdf

*Awaiting confirmation from HR
Technical Complexity Drives Capital & Operational Demand

- Energy Consumption
- Maintenance Staffing Levels
- Stewardship Need
- Maintenance Materials

**Technical Complexity (1-5)**

- **Tech Rating**
- **Peer Average**
- **Flagship Average**

**UNF FY17 Tech Rating Distribution**

- Total GSF (Thousands)
  - Tech 1
  - Tech 2
  - Tech 3
  - Tech 4
  - Tech 5

- More complex
- Less complex
UND Achieves Efficiencies Through Larger Buildings

Economies of scale | Operations Staffing Efficiency
---|---
Impact | |
Magnitude of Failure | Flexibility of space

### Building Intensity

**Peer Average:**
- UND: 39.6
- A: 32.1
- B: 32.0
- C: 32.0
- D: 32.0
- E: 32.0
- F: 32.0
- G: 32.0

**Flagship Average:**
- UND: 34.681
- A: 42,705
- B: 34,681
- C: 34,681
- D: 34,681
- E: 34,681
- F: 34,681
- G: 34,681

### Average Building Size

**Peer Average:**
- UND: 39.6
- A: 32.1
- B: 32.0
- C: 32.0
- D: 32.0
- E: 32.0
- F: 32.0
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**Flagship Average:**
- UND: 34.681
- A: 42,705
- B: 34,681
- C: 34,681
- D: 34,681
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- F: 34,681
- G: 34,681

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## Adding Context to Campus Age

Waves of construction are competing for resources

<table>
<thead>
<tr>
<th>Era</th>
<th>Description</th>
<th>Age Range</th>
<th>Characteristics</th>
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</thead>
<tbody>
<tr>
<td>Pre-War</td>
<td>Durable construction</td>
<td>Built before 1951</td>
<td>OLder but typically lasts longer</td>
</tr>
<tr>
<td>Post-War</td>
<td>Lower-quality construction</td>
<td>Built from 1951 to 1975</td>
<td>Already needing more repairs and renovations</td>
</tr>
<tr>
<td>Modern</td>
<td>Quick-flash construction</td>
<td>Built from 1976 to 1990</td>
<td>Low-quality building components</td>
</tr>
<tr>
<td>Complex</td>
<td>Technically complex spaces</td>
<td>Built in 1991 and newer</td>
<td>Higher-quality, more expensive to maintain &amp; repair</td>
</tr>
</tbody>
</table>

### Sightlines Database - Construction Age

<table>
<thead>
<tr>
<th>Era</th>
<th>DB Average</th>
<th>UND:</th>
<th>UND:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-War</td>
<td>20%</td>
<td>18%</td>
<td></td>
</tr>
<tr>
<td>Post-War</td>
<td>36%</td>
<td>39%</td>
<td></td>
</tr>
<tr>
<td>Modern</td>
<td>15%</td>
<td>21%</td>
<td></td>
</tr>
<tr>
<td>Complex</td>
<td>30%</td>
<td>22%</td>
<td></td>
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</tbody>
</table>

### UND - Construction Age

<table>
<thead>
<tr>
<th>Era</th>
<th>DB Average</th>
<th>UND:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-War</td>
<td>18%</td>
<td></td>
</tr>
<tr>
<td>Post-War</td>
<td>39%</td>
<td></td>
</tr>
<tr>
<td>Modern</td>
<td>21%</td>
<td></td>
</tr>
<tr>
<td>Complex</td>
<td>22%</td>
<td></td>
</tr>
</tbody>
</table>
UND Age Profile

Flagships and peers have renovated more than UND

Weighted Campus Age

- UND: 46 years
  - Construction Age: 43 years (-3 years)
  - Renovation Age: 38 years (-8 years)

- Peers: 46 years
  - Construction Age: 39 years (-9 years)
  - Renovation Age: 38 years

- Flagships: 48 years
  - Construction Age: 39 years (-9 years)
  - Renovation Age: 38 years
Campus Age Profile

UND space demands higher capital investment and more reactive maintenance than peers

Campus Renovation Age by Category

- **Capital Needs**
  - Under 10: 17% UND, 13% Peers, 15% Flagships
  - 10 to 25: 7% UND, 25% Peers, 24% Flagships
  - 25 to 50: 39% UND, 31% Peers, 31% Flagships
  - Over 50: 37% UND, 31% Peers, 31% Flagships

- **Preventive Maintenance**
- **Reactive Maintenance**

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Capital & Deferred Maintenance
UND Had Higher Investment in Past Few Years

Excluded projects reflect spending into non-state supported space

<table>
<thead>
<tr>
<th></th>
<th>FY13</th>
<th>FY14</th>
<th>FY15</th>
<th>FY16</th>
<th>FY17</th>
</tr>
</thead>
<tbody>
<tr>
<td>Included in Scope</td>
<td>$0</td>
<td>$20,000,000</td>
<td>$60,000,000</td>
<td>$80,000,000</td>
<td>$100,000,000</td>
</tr>
<tr>
<td>Excluded from Scope</td>
<td>$20,000,000</td>
<td>$40,000,000</td>
<td>$40,000,000</td>
<td>$20,000,000</td>
<td>$20,000,000</td>
</tr>
</tbody>
</table>

Total Capital Spending

- Including excluded projects reflects a total investment of at least $100,000,000 by FY15.
Capital Included in Scope – By Funding Source

Annual Stewardship  
*Recurring Capital*

Extraordinary Repairs  
Deferred Maintenance  
General Plant

Asset Reinvestment  
*One-time Capital*

Unexpended Plant Funds  
Departmental Funds  
Gifts/Grants

### Spending by Funding Source

- **FY13**
  - Annual Stewardship:
  - Asset Reinvestment:

- **FY14**
  - Annual Stewardship:
  - Asset Reinvestment:

- **FY15**
  - Annual Stewardship:
  - Asset Reinvestment: $80,000,000

- **FY16**
  - Annual Stewardship:
  - Asset Reinvestment: $70,000,000

- **FY17**
  - Annual Stewardship:
  - Asset Reinvestment: $20,000,000
UND’s Investment Focused on New Space

72% of spending was for new space on campus
Peer Capital Investment Focus is More Balanced

A larger proportion of peer investment is into existing space than at UND.

UND Capital Investment by Type FY13 – FY17
- Existing Space: 17%  
- Infrastructure: 4%  
- New Space: 72%  
- Non-Facilities: 7%

Peer Capital Investment by Type FY13 – FY17
- Existing Space: 39%  
- Infrastructure: 7%  
- New Space: 47%  
- Non-Facilities: 5%

Flagship Capital Investment by Type FY13 – FY17
- Existing Space: 45%  
- Infrastructure: 7%  
- New Space: 12%  
- Non-Facilities: 38%
Investment into Existing Assets

Peers have a more balanced investment focus than UND

Capital Investment in Existing space

<table>
<thead>
<tr>
<th>Year</th>
<th>Envelope</th>
<th>Building Systems</th>
<th>Space Renewal</th>
<th>Safety/Code</th>
<th>Infrastructure</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013</td>
<td>4.00</td>
<td>2.00</td>
<td>2.00</td>
<td>0.00</td>
<td>2.00</td>
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<td>2014</td>
<td>4.00</td>
<td>2.00</td>
<td>2.00</td>
<td>0.00</td>
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<tr>
<td>2015</td>
<td>4.00</td>
<td>2.00</td>
<td>2.00</td>
<td>0.00</td>
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<td>2016</td>
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<td>2017</td>
<td>4.00</td>
<td>2.00</td>
<td>2.00</td>
<td>0.00</td>
<td>2.00</td>
</tr>
</tbody>
</table>

UND Capital Investment by Package (FY13 – FY17)
- Envelope: 11%
- Building Systems: 35%
- Space Renewal: 24%
- Safety/Code: 3%
- Infrastructure: 27%

Peer Capital Investment by Package (FY13 – FY17)
- Envelope: 12%
- Building Systems: 37%
- Space Renewal: 35%
- Safety/Code: 4%
- Infrastructure: 12%
UND Stewardship Comparable to Peers

UND’s recurring capital funding is just slightly below peer levels

Annual Stewardship Funding of Existing Space

*Excludes infrastructure spending
Reflect Recurring Capital and PM
Peers Far Outspend UND With All Sources Included

Peers have access to much greater one-time capital resources than UND

Total Capital Investment into Existing Space

UND

$2.02

2013

Peers

$4.11

2014

$4.67

2015

2016

2017

$/GSF

Annual Stewardship

Asset Reinvesment

UND Avg

Peer Avg.

Flagship Avg.

*Excludes infrastructure spending
Defining an Annual Investment Target

Annual Funding Target: $19.6M

FY17 Annual Investment Target

- 3% Replacement Value: $41.2M
- Life Cycle Need: $20.9M
- Annual Investment Target: $7.3M

Replacement Value: $1.37B

Functional obsolescence drives investment prior to life cycles & discounts the annual investment target.
UND’s Investment Is Below Targets

New space in 2017 drove up targets

Total Capital Investment vs. Funding Target

- Decreasing Backlog
- Sustaining Backlog
- Increasing Backlog

- Annual Stewardship
- Asset Reinvestment
- Life Cycle Need
- Annual Investment Target
Total Need of Buildings Greater Than Peer Needs

Total Asset Reinvestment Need

- Peer Average
- Flagship Avg

UND Need by Age Category

$ in Millions

- Under 10
- 10-25
- 25-50
- Over 50

$/GSF

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Operating Budget
Facilities Operating Expenditures vs. Peers

UND spending is comparable to peers; flagships have much higher resource levels.

Facilities Operating Actuals

- **UND**
  - Daily Service
  - PM
  - UND Average

- **Peers**
  - Peer Average
  - Flagship Average

<table>
<thead>
<tr>
<th>Year</th>
<th>$/GSF</th>
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<tbody>
<tr>
<td>2013</td>
<td>$3.12</td>
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<td>2016</td>
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<tr>
<td>2017</td>
<td>$3.00</td>
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</table>

<table>
<thead>
<tr>
<th>Year</th>
<th>$/GSF</th>
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<tbody>
<tr>
<td>2013</td>
<td>$3.22</td>
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<tr>
<td>2014</td>
<td>$3.22</td>
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<tr>
<td>2015</td>
<td>$3.22</td>
</tr>
<tr>
<td>2016</td>
<td>$3.22</td>
</tr>
<tr>
<td>2017</td>
<td>$3.22</td>
</tr>
</tbody>
</table>
FY17 Facilities Operating Expenditures vs. Peers

When regionally adjusted, UND operating actuals remain right at peer average

UND Budget Mix
- Daily Service: 71%
- PM: 4%
- Utilities: 25%

Peer 5-Year Mix
- Daily Service: 58%
- PM: 36%
- Utilities: 6%
Preventative Maintenance Investment Less Than Peers

Increases in PM yield future savings by protecting assets and lengthening lifecycles

Preventive Maintenance Spending

$/GSF

Peer Average
Flagship Average

$0.26
$0.37

Preventive Maintenance Spending

% of budget

Peer Average
Flagship Average

Best Practice Range

5.3%
5.7%

0.0%
2.0%
4.0%
6.0%
8.0%
10.0%
12.0%
14.0%
Maintenance Profile Compared to Peers

Maintenance staff is covering more space with less materials than peers

Maintenance Staffing

Maintenance Supervision

Maintenance Materials
Custodial Profile Compared to Peers

UND and peers cover more space than is typical; UND also has less supervision.
Grounds Profile Compared to Peers

UND is spending $214/Acre less than the peer average
Energy
Fossil Consumption Decreasing Over Time

UND Energy Consumption

- **BTU/GSF**: Btu per gross square foot
- **Degree Days**: Degree days

- **2013**: 160,000 BTU/GSF, 120,000 Degree Days
- **2014**: 150,000 BTU/GSF, 110,000 Degree Days
- **2015**: 140,000 BTU/GSF, 100,000 Degree Days
- **2016**: 130,000 BTU/GSF, 90,000 Degree Days
- **2017**: 120,000 BTU/GSF, 80,000 Degree Days

- **Fossil Consumption**: Blue
- **Electric Consumption**: Red
- **Degree Days**: Diamond

The chart shows a decrease in fossil consumption over time, with a corresponding increase in degree days.
UND Consumes Less than Peers

UND degree days were about 50% greater than the national average in FY17

FY17 Energy Consumption vs. Peers

UND degree days were about 50% greater than the national average in FY17.
UND’s Weather-Normalized Energy Profile is Strong

FY17 Energy Consumption vs. Peers – Normalized by Degree Day

<table>
<thead>
<tr>
<th></th>
<th>Total Energy Consumption - DD Normalized</th>
<th>Peer Normalized Average</th>
<th>Flagship Peer Normalized Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B</td>
<td></td>
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