State of Oregon

DCS 2024 Service Benchmark

Final Report

January 15th, 2025
Engagement # 660003042

Gartner®

Contents

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Project Overview

Engagement Scope and Objectives

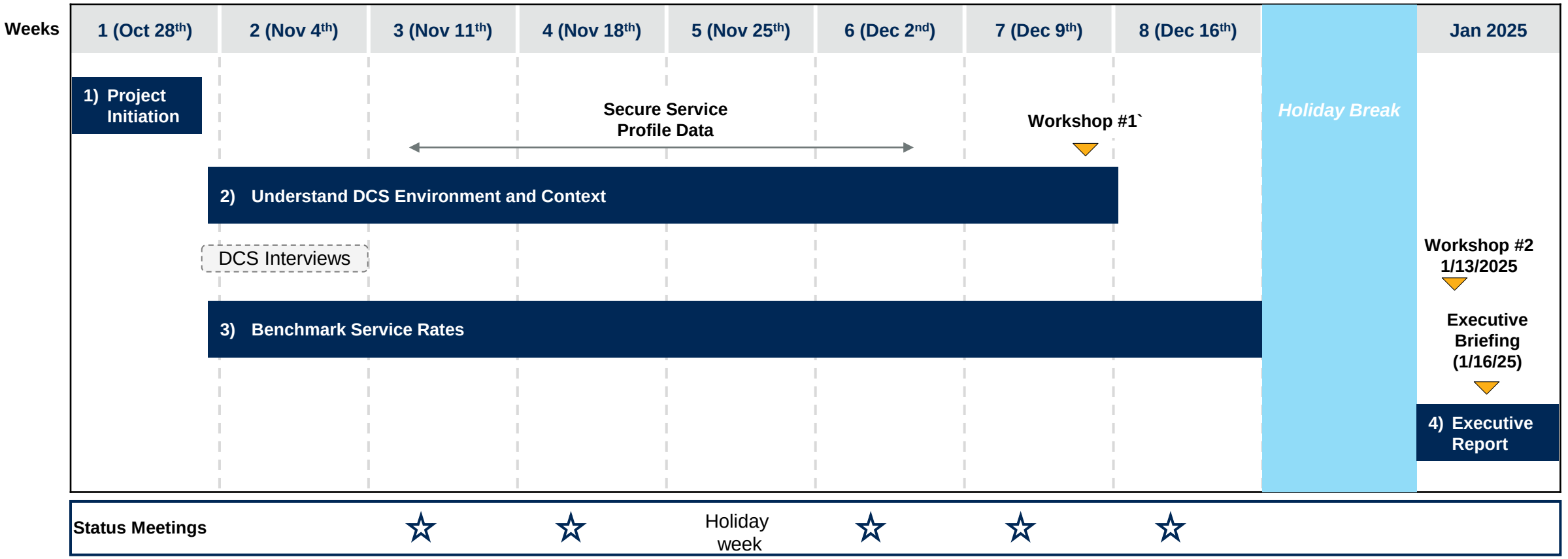
Scope

- Conduct service rate benchmarks for DCS Services aligned with other State and Local Government services and rates
- Rate Benchmarks include:
  - X86 Server: Server Instance, System CPU Resource, System Memory Resource
  - Midrange: iSeries Virtual OS, UNIX Virtual OS, System CPU Resource, System Memory Resource
  - Mainframe: Batch Processing, CICS, DB2 Processing, TSO Processing
  - Data Storage: Enterprise Storage, Mainframe Storage, Backup Services
  - Colocation: Colocation Service (Rack)
  - Data Network Services: LAN Service, Wireless Service
  - Cloud Service Brokering

Objectives

- Ensure competitiveness of rates against peers
- Understand how DCS should evolve to continue providing value to their customers

Baseline Project Schedule



Executive Summary

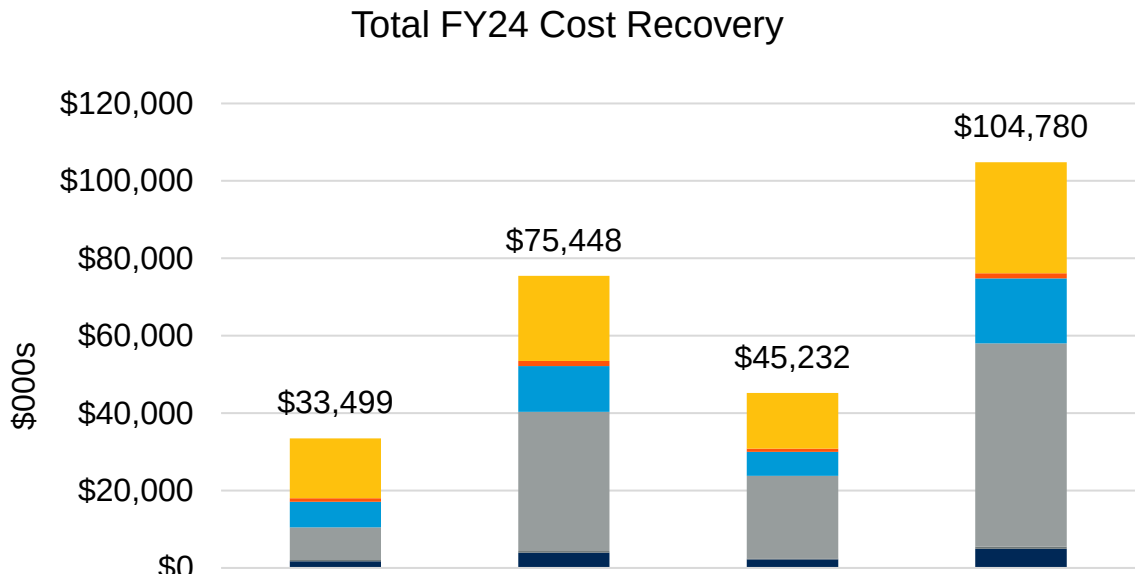
Identified Peers are state government entities providing similar services

- Peers are all state government shared services organizations.
- Peer rates are drawn from current-year as published in service catalogs.
- Peer Service Catalogs are reviewed to ensure a similar scope of service to that which DCS provides.
  - Some adjustments have been made to peer rates to align with the DCS rate structure, such as to include Storage in Midrange iSeries services.

Group	Service	Monthly Billed Units
x86 Servers	Server Instance (OS Instance)	3,717
	System CPU Resource (Core)	21,895
	System Memory Resource (GB)	108,935
Midrange	iSeries (OS Instance)	7
	UNIX (OS Instance)	43
	System CPU Resource (Core)	170
	System Memory Resource (GB)	1,900
Mainframe	Batch Processing (Minute)	19,756
	CICS Processing (Minute)	2,140
	DB2 Processing (Minute)	7,669
	TSO Processing (Minute)	481
Storage	Enterprise Storage (PB)	7.2
	Mainframe Storage (TB)	23.3
	Backup Storage (PB)	37.1
Colocation	Colocation (Rack)	32
Data Network	22-Port Switch (Equivalent)	2,912
	Wireless Device	4,661

Total annual recoverable costs in FY24 by 2023-25 biennium rates is 56% ($42.0M) less than peer average

- Based on rates for the 2023-25 biennium, total recoverable costs in FY 2024 for the benchmarked services is about **56% ($42.0M) less than the peer group average** for comparable services, $33.8M vs $75.5M.
- Cost recovery for Data Storage and Data Network rates is less than the peer 25th percentile.
  - Data Storage is **77% ($27.6M) less than the peer average** and 61% ($12.9M) less than the 25th percentile.
  - Data Network is **56% ($2.2M) less than the peer average** and 22% ($0.5M) less than the 25th percentile.
- Cost recovery in other areas is more closely aligned to peers:
  - X86 Servers is 29% ($6.5M) less.
  - Colocation is 10% ($40K) less.
  - Midrange is 28% ($0.4M) less.
  - Mainframe is 44% ($5.2M) less.
- The uplift for Cloud Services of 4% is 69% and 55% less than the peer average and peer 25th percentile of 13.1% and 9% respectively.
- DCS sets service rates so that any over- or under-recovery from the previous biennium is passed through to customers. This practice can cause rates to swing from period to period.

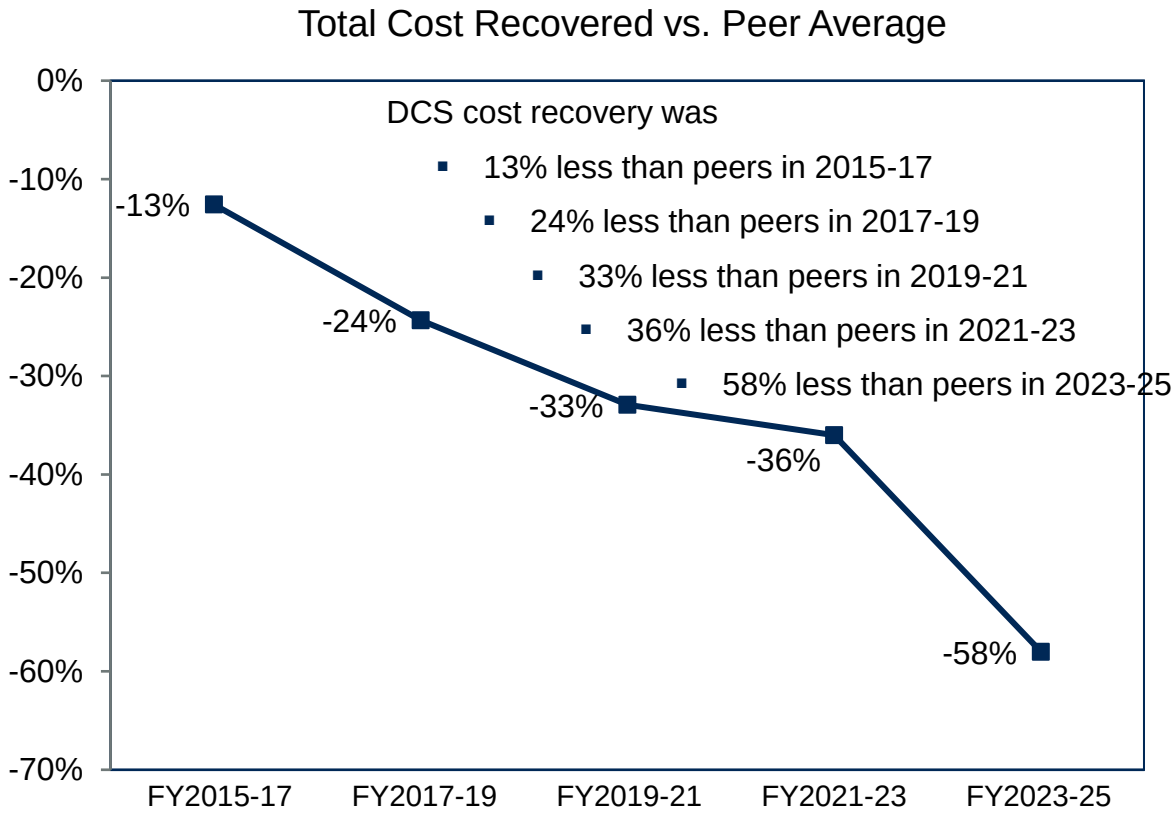


	OR DCS 23-25	State Peer Avg	State Peer 25th	State Peer 75th
x86 Server	$15,511	$21,993	$14,375	$28,609
Midrange	$907	$1,265	$873	$1,363
Mainframe	$6,598	$11,829	$6,197	$16,816
Data Storage	$8,393	$36,020	$21,338	$52,462
Colocation	$342	$382	$216	$561
Data Network	$1,747	$3,957	$2,234	$4,967
Total Cost Recovery	$33,499	$75,448	$45,232	$104,780

Denotes recovery that is less than the peer 25th percentile.

Total cost recovery continues to drop faster than peers

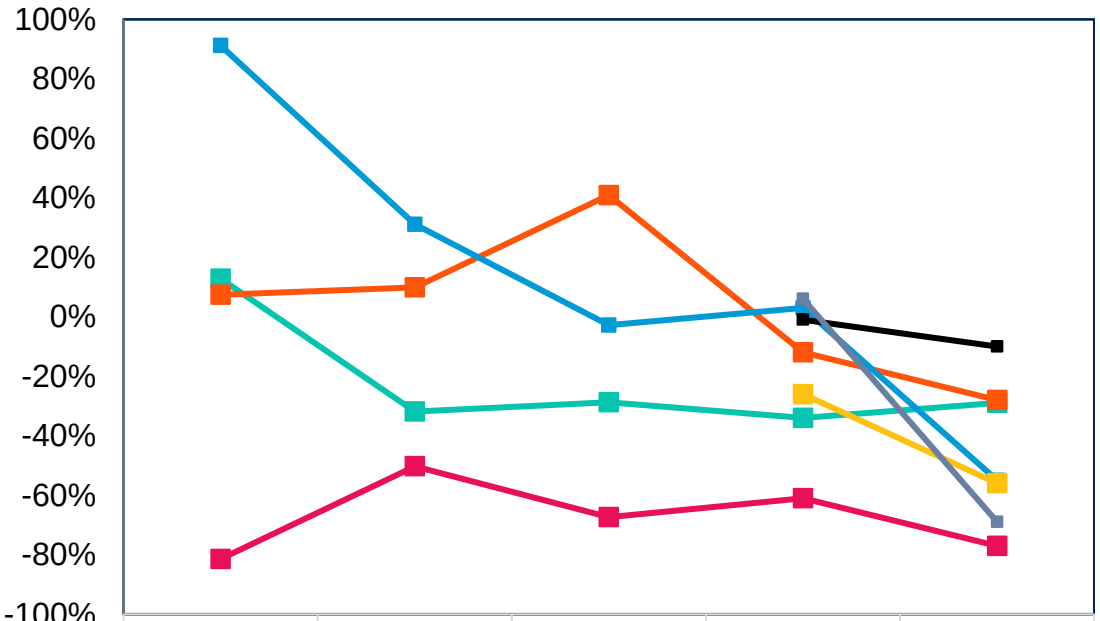
- Gartner has conducted rate comparisons for DCS since the 2015-2017 biennium.
- Compared to peer average, **total costs recovered dropped faster than peer cost recovery** would for the same services and service volumes.
- DCS has improved efficiency over the years, and has also worked to:
  - Improve its budget and forecast accuracy
  - Better align incurred cost with recovery
  - More closely align costs with specific service offerings.



Total cost recovery continues to drop faster than peers (cont.)

- While still significantly lower than peers (29%), rates for **x86 Servers** are the only group of services for which the rate of decrease was higher for peers than for DCS. x86 Services account for about 46% of in-scope recoverable costs.)
- **Midrange** rates have continued to drop in relation to peers. Midrange service only accounts for about 3% of the in-scope recoverable costs.
- **Mainframe** rates dropped significantly (55%) for the current biennium after remaining relatively flat for the previous biennium. Mainframe services account for about 20% of in-scope recoverable costs.
- **Storage** cost recovery is consistently lowest compared to peers and accounts for about 25% of in-scope recoverable costs.
- **Colocation** only accounts for 1% of recovery of in-scope services and is slightly lower than peers.
- **Data Network** rates dropped at a faster rate than peers. Data Network accounts for 5% of in-scope recovery.
- **Cloud Services** was higher than peers in the last analysis but is now 69% lower than peers.

Cost Recovered vs. Peer Average by Service Grouping



	2015-17	2017-19	2019-21	2021-23	2023-25
x86 Servers	13%	-32%	-29%	-34%	-29%
Midrange	7%	10%	41%	-12%	-28%
Mainframe	91%	31%	-3%	3%	-55%
Storage	-81%	-50%	-67%	-61%	-77%
Colocation				-1%	-10%
Data Network				-26%	-56%
Cloud Uplift				6%	-69%

The rate structure of the services included in the analysis is generally in line with other states

- Most other states have similar rate structures for x86, Midrange, Mainframe and Storage services.
  - For x86 Servers:
    - A few states charge separate rates for labor versus hardware/software for customers that own their own servers.
    - More states are charging for a base server with add-ons for CPU and RAM. Some states charge a flat rate per server, or a tiered rate based on a standard server “size” (e.g., small, medium, large).
  - For Mainframe, states are mixed in charging separate rates for Batch, CICS, DB2 and TSO versus a flat rate for all.
  - For Midrange, states are mixed in charging a flat rate per server, charging based on standard size definitions (e.g., small, medium, large, extra large) and charging for a base server with add-ons for CPU and RAM.
    - The DCS iSeries Virtual Operating System Service includes customer data storage capacity. Most states charge for all storage separately.
  - For Storage, historically, most states have had separate rates for SAN/NAS environments and Mainframe. However, increased use of auto-tiering is causing more states to move to a single rate for enterprise Storage.

The rate structure of the services included in the analysis is generally in line with other states (cont.)

- Colocation services are generally charged per rack.
  - Some states also offer colocation services on a per rack unit basis..
- Some states are charging Local Area Network services per switch, with similar numbers offering rates by switch size (e.g., separate rates for 12, 24 or 48 port switches) or charging a flat rate per LAN user or device.
  - Wireless devices are generally charged separately, unless there is a flat rate per user or device.
  - States charging by switch size also tend to charge Wide Area Network services similarly (e.g., small, medium large rates for routers and firewalls). These states will also often charge for dedicated network circuits separately.
- Where cloud services are offered, many states are charging a flat surcharge on vendor invoices.
  - Some states appear to be calculating that cost into a fixed rate for specific cloud services offerings (e.g., $x.xx per GB of Cloud Storage).

Detailed Rate Benchmarks

Executive Summary

DCS rates have decreased more than peer rates for the current biennium

		Rate				Annual Volume				Recovery ($000s)			
Group	Service	FY23-25	FY21-23	Incr/ (Decr)	% Incr/ (Decr	FY23-25	FY21-23	Incr/ (Decr)	% Incr/ (Decr	FY23-25	FY21-23	Incr/ (Decr)	% Incr/ (Decr)
x86 Servers	Server Instance (OS Instance)	27.40	29.26	(1.86)	-6.4%	44,604	40,172	4,432	11.0%	$1,222	$1,175	$47	4.0%
	System CPU Resource (Core)	12.99	14.58	(1.59)	-10.9%	262,740	251,861	10,879	4.3%	$3,413	$3,672	-$259	-7.1%
	System Memory Resource (GB)	8.32	10.25	(1.93)	-18.8%	1,307,220	1,248,007	59,213	4.7%	$10,876	$12,792	-$1,916	-15.0%
Total x86 Servers										**$15,511**	**$17,640**	**-$2,128**	**-12.1%**
Midrange	iSeries (OS Instance)	2,146.43	3,110.50	(964.07)	-31.0%	84	84	-	0.0%	$180	$261	-$81	-31.0%
	UNIX (OS Instance)	326.66	638.71	(312.05)	-48.9%	517	698	(181)	-26.0%	$169	$446	-$277	-62.1%
	System CPU Resource (Core)	118.11	198.01	(79.90)	-40.4%	2,040	1,807	233	12.9%	$241	$358	-$117	-32.7%
	System Memory Resource (GB)	13.91	47.89	(33.98)	-71.0%	22,800	17,308	5,492	31.7%	$317	$829	-$512	-61.7%
Total Midrange										**$907**	**$1,894**	**-$987**	**-52.1%**
Mainframe	Batch Processing (Minute)	14.06	32.62	(18.56)	-56.9%	237,068	250,624	(13,556)	-5.4%	$3,333	$8,175	-$4,842	-59.2%
	CICS Processing (Minute)	21.24	49.16	(27.92)	-56.8%	25,679	48,384	(22,705)	-46.9%	$545	$2,379	-$1,833	-77.1%
	DB2 Processing (Minute)	28.67	44.03	(15.36)	-34.9%	92,026	91,470	556	0.6%	$2,638	$4,027	-$1,389	-34.5%
	TSO Processing (Minute)	14.06	32.62	(18.56)	-56.9%	5,775	7,386	(1,611)	-21.8%	$81	$241	-$160	-66.3%
Total Mainframe										**$6,598**	**$14,822**	**-$8,224**	**-55.5%**
Storage	Enterprise Storage (GB)	0.06	0.09	(0.03)	-33.3%	86,797,608	70,484,695	16,312,913	23.1%	$5,208	$6,344	-$1,136	-17.9%
	Mainframe Storage (GB days)	0.06	0.09	(0.03)	-33.3%	8,510,346	983,039	7,527,307	765.7%	$511	$88	$422	477.1%
	Backup Storage (GB)	0.006	0.02	(0.01)	-60.0%	445,787,253	378,959,860	66,827,393	17.6%	$2,675	$5,684	-$3,010	-52.9%
Total Storage										**$8,393**	**$12,116**	**-$3,723**	**-30.7%**
Colocation	Colocation (Rack)	899.51	863.02	36.49	4.2%	380	188	192	102.1%	$342	$162	$180	110.7%
Total Colocation										**$342**	**$162**	**$180**	**110.7%**
Data Network	22-Port Switch (Equivalent)	32.00	44.71	(12.71)	-28.4%	34,944	103,407	(68,463)	-66.2%	$1,118	$4,623	-$3,505	-75.8%
	Wireless Device (Device)	11.24	15.31	(4.07)	-26.6%	55,932	41,122	14,810	36.0%	$629	$630	-$1	-0.1%
Total Data Network										$1,747	$5,253	-$3,506	-66.7%
Total All Services										**$33,499**	**$51,888**	**-$18,389**	**-35.4%**

x86 Servers

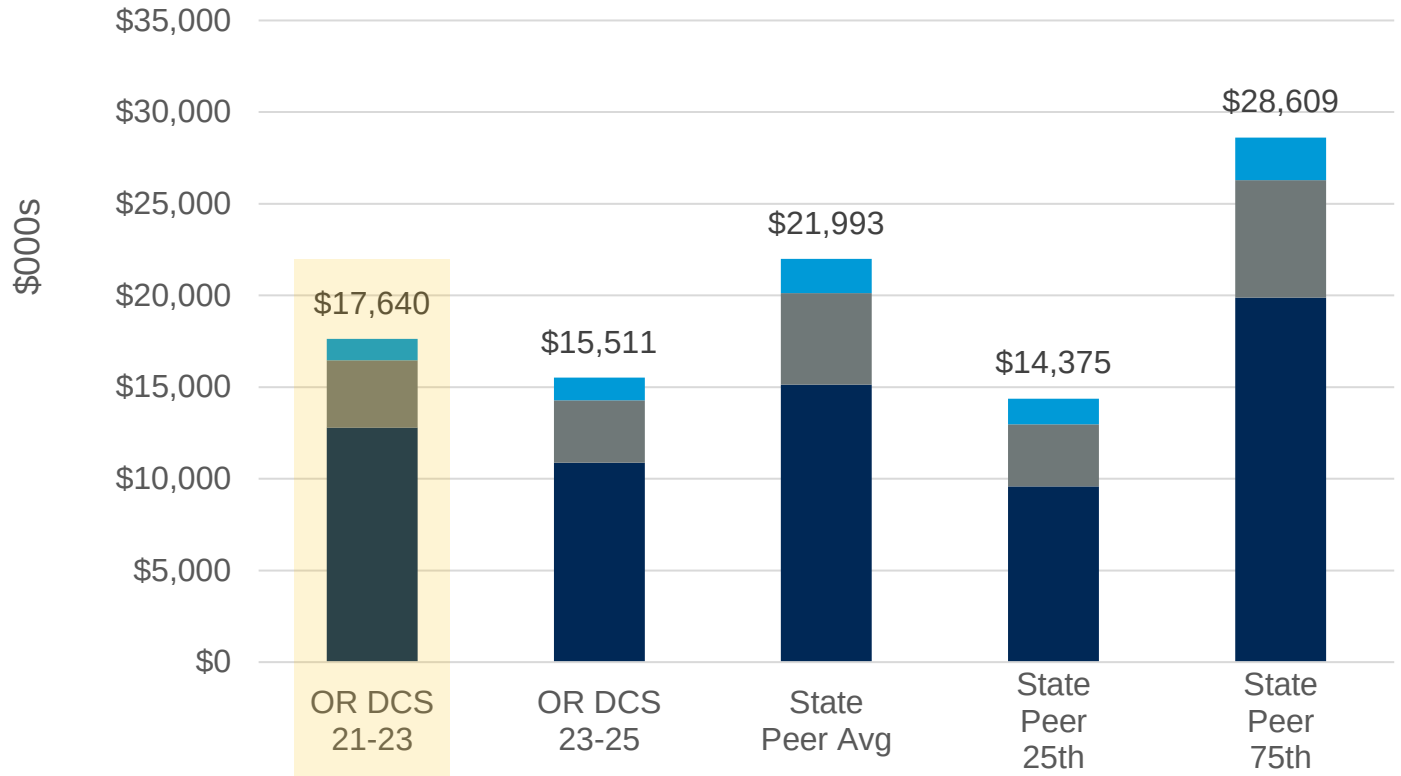
x86 Servers Demographics

- DCS Demographics

X86 Servers	Monthly Billed Units
Server Instance	3,717
System CPU Resource Allocation	21,895
System Memory Resource Allocation	108,935

- Peer Demographics
  - 17 Government Organizations

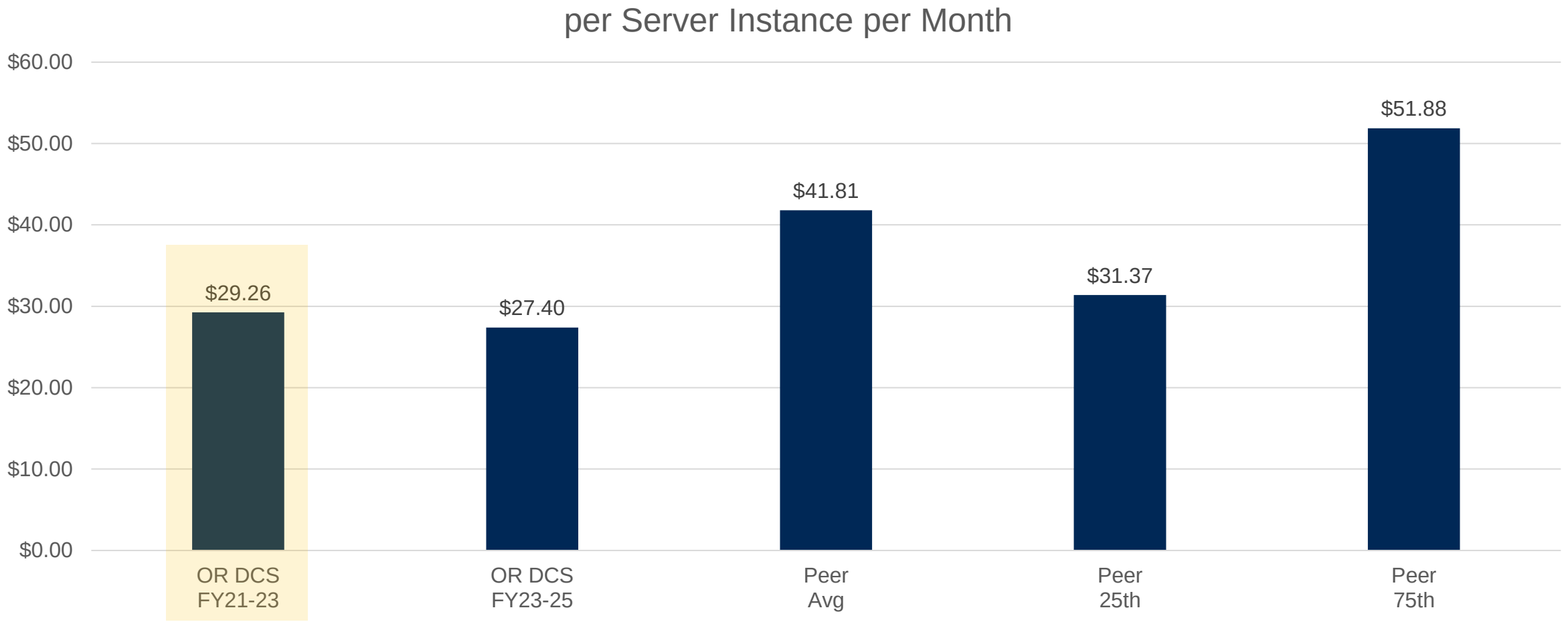
x86 Servers
Annual Cost Recovered



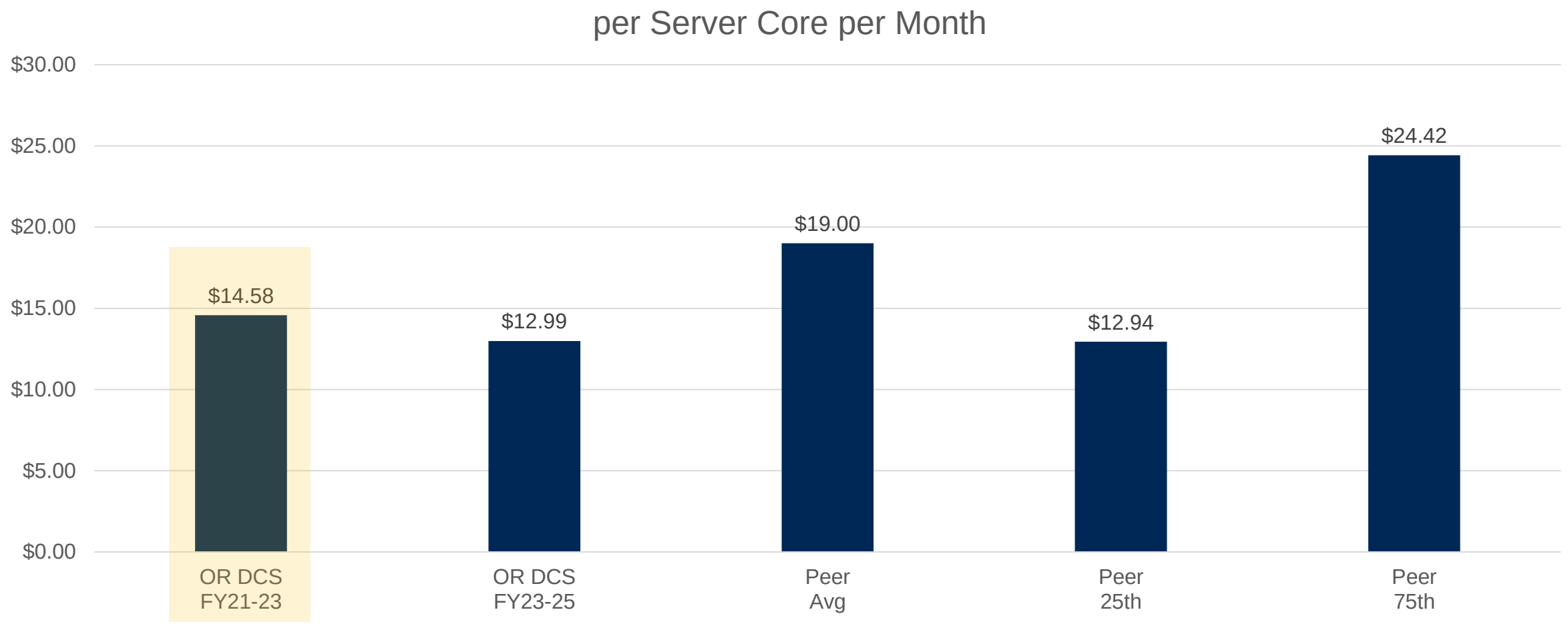
	OR DCS 21-23	OR DCS 23-25	State Peer Avg	State Peer 25th	State Peer 75th
Server Instance	$1,175	$1,222	$1,865	$1,399	$2,314
System CPU Resource	$3,672	$3,413	$4,993	$3,399	$6,416
System Memory Resource	$12,792	$10,876	$15,135	$9,577	$19,880
Total Cost Recovered	$17,640	$15,511	$21,993	$14,375	$28,609

- Total annual cost recovered by the x86 Server rates analyzed is $6.5M (29%) lower than peers would recover based on rates for the same billed volumes.
- x86 Server rates have been lower than peers by about 30% for the past four biennia.
- DCS has a very standardized environment and is increasing the number of VMs per host to keep its costs low.

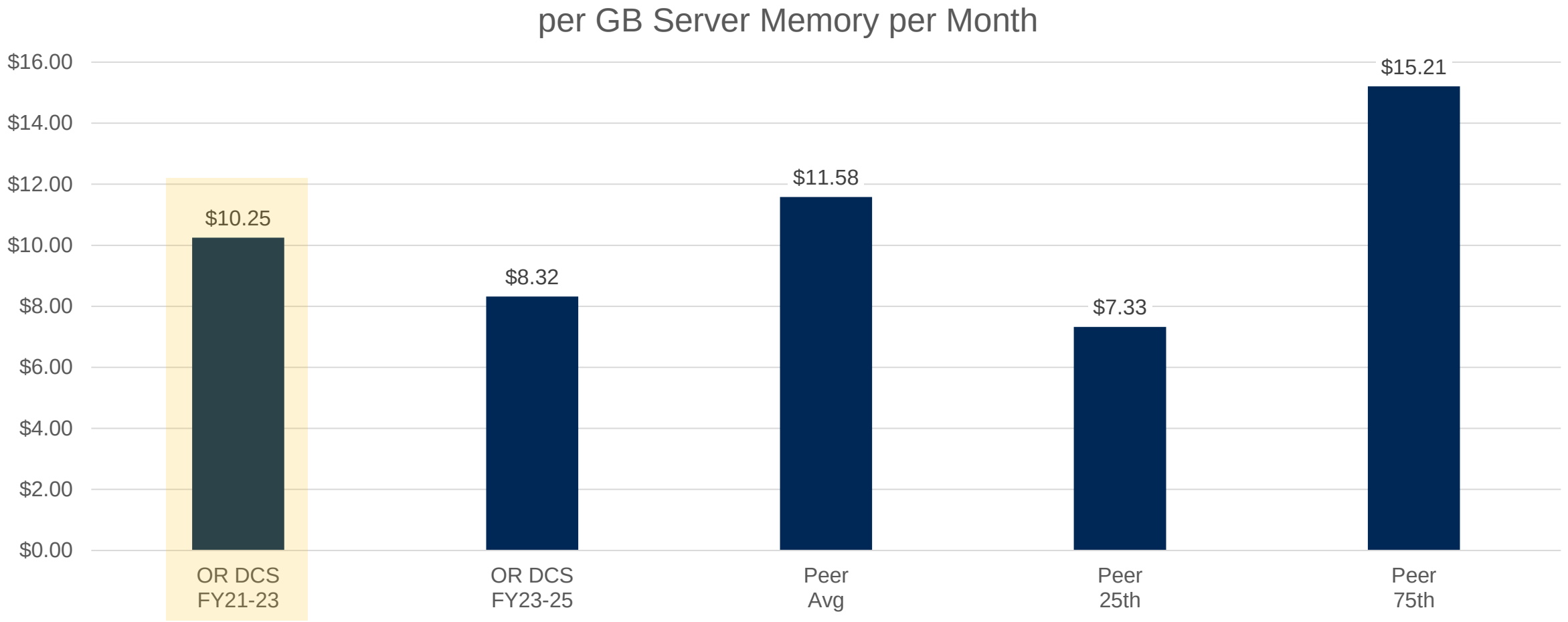
x86 Servers – Server Instance
Cost per Server Instance per Month



x86 Servers – System CPU Resource Allocation
Cost per Server Core per Month



x86 Servers – System Memory Resource Allocation
Cost per GB Server Memory per Month



Midrange
iSeries & UNIX

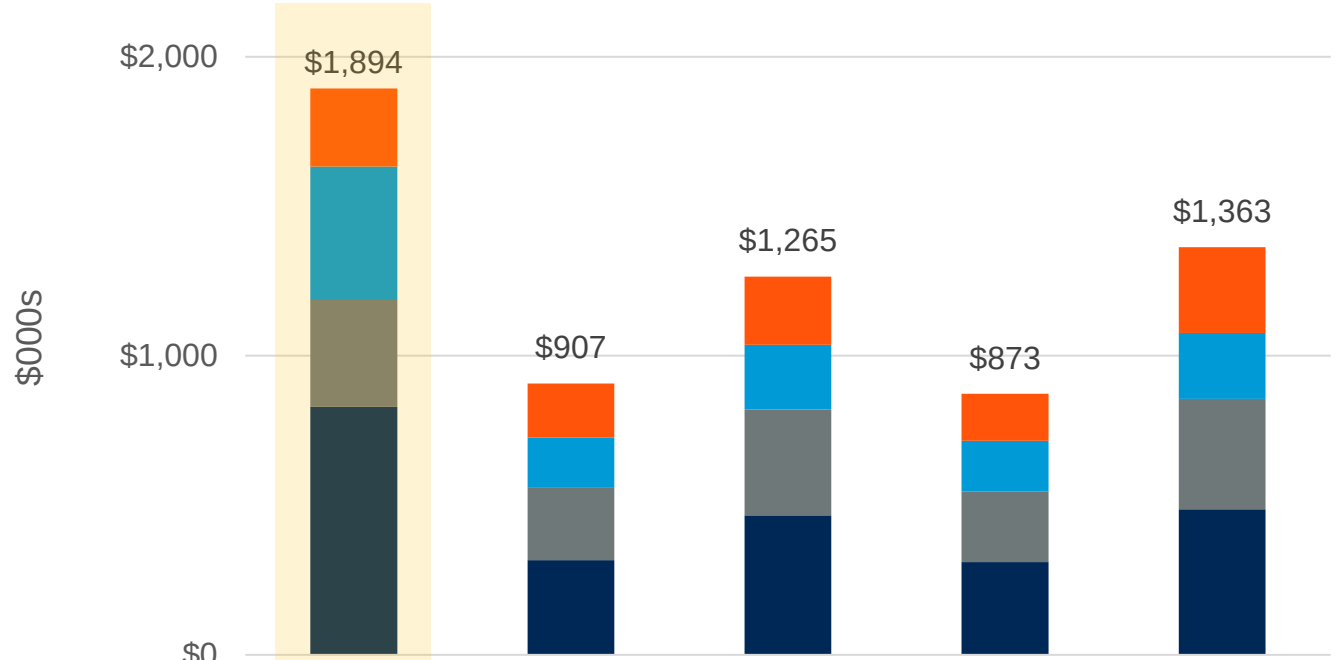
Midrange iSeries & UNIX Demographics

- DCS Demographics

Midrange iSeries and UNIX	Monthly Billed Units
Virtual Operating System Service – iSeries	7
Virtual Operating System Service - UNIX	43
System CPU Resource Allocation	170
System Memory Resource Allocation	1,900

- Peer Demographics
  - iSeries
    - 3 Government Organizations
    - Storage costs were drawn from the Storage rate comparison in this report
  - UNIX
    - 11 Government Organizations

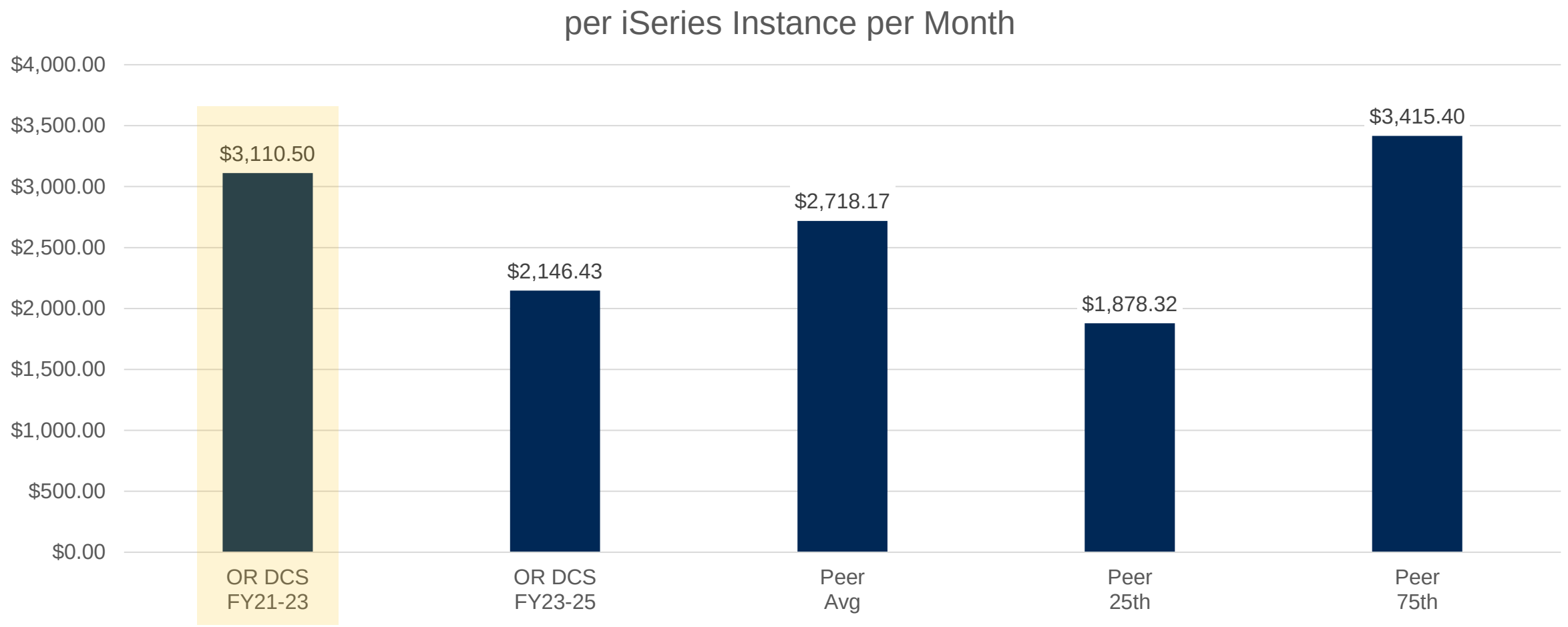
Midrange Services
Annual Cost Recovered



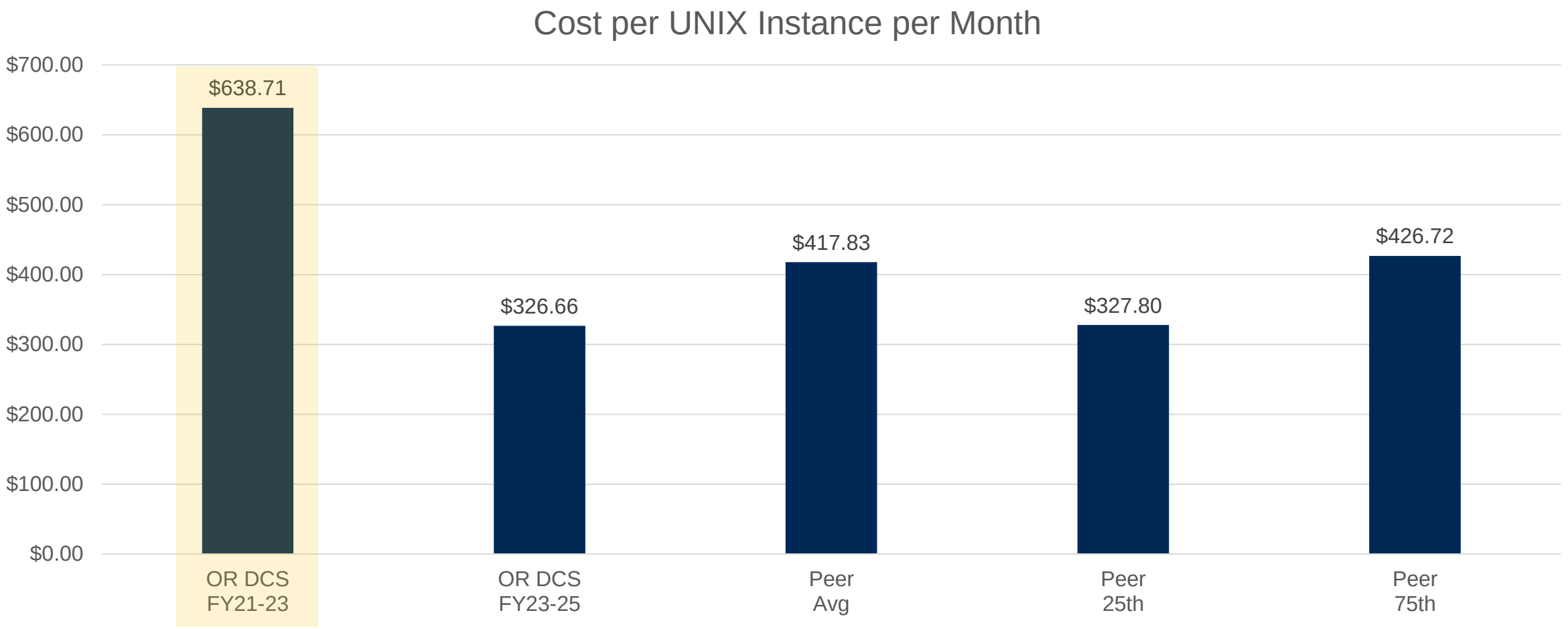
	OR DCS 21-23	OR DCS 23-25	State Peer Avg	State Peer 25th	State Peer 75th
Virtual OS Service, iSeries	$261	$180	$228	$158	$287
Virtual OS Service, Unix	$446	$169	$216	$169	$221
System CPU Resource	$358	$241	$354	$236	$370
System Memory Resource	$829	$317	$467	$310	$486
Total Cost Recovered	$1,894	$907	$1,265	$873	$1,363

- Total annual cost recovered by Midrange rates analyzed is $358K (28%) less than peers would recover based on rates for the same billed volumes.
- The peer group for iSeries is now very small (3 state government shared services organizations) reflecting.

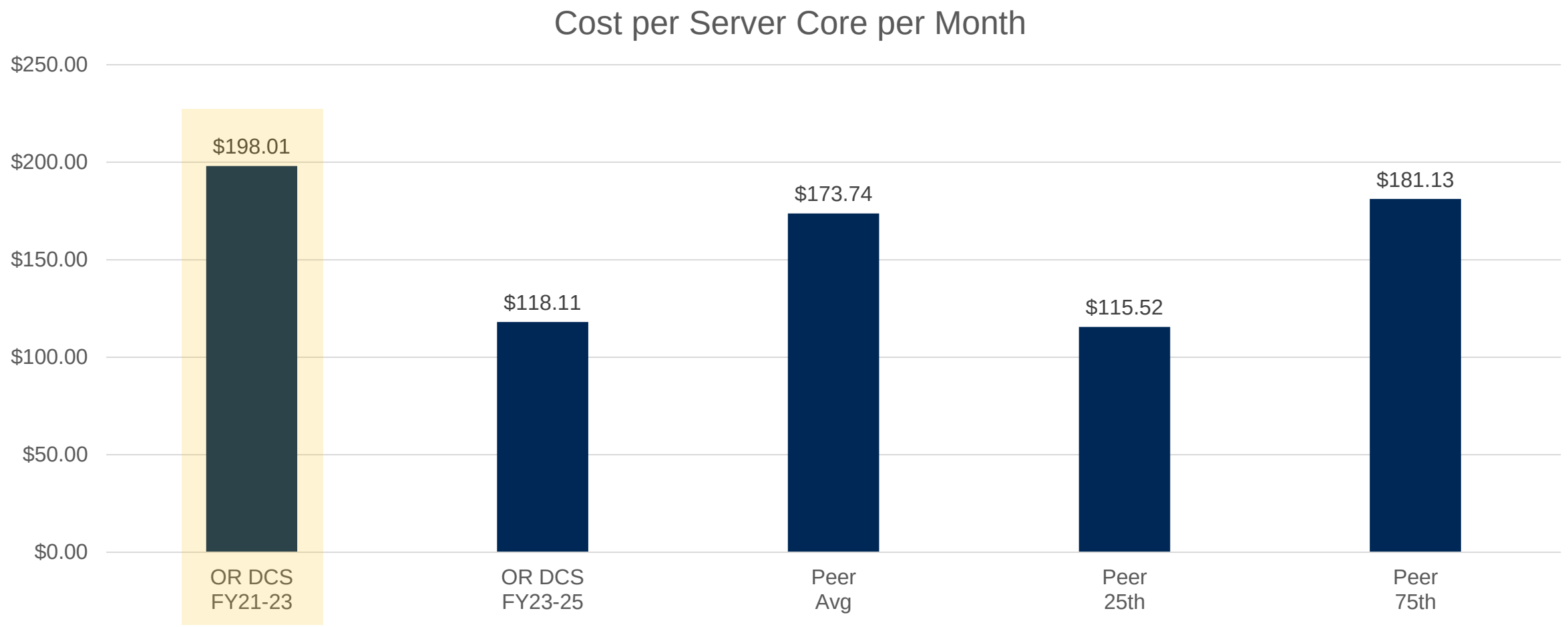
Midrange – Virtual Operating System Service – iSeries
Cost per iSeries Instance per Month



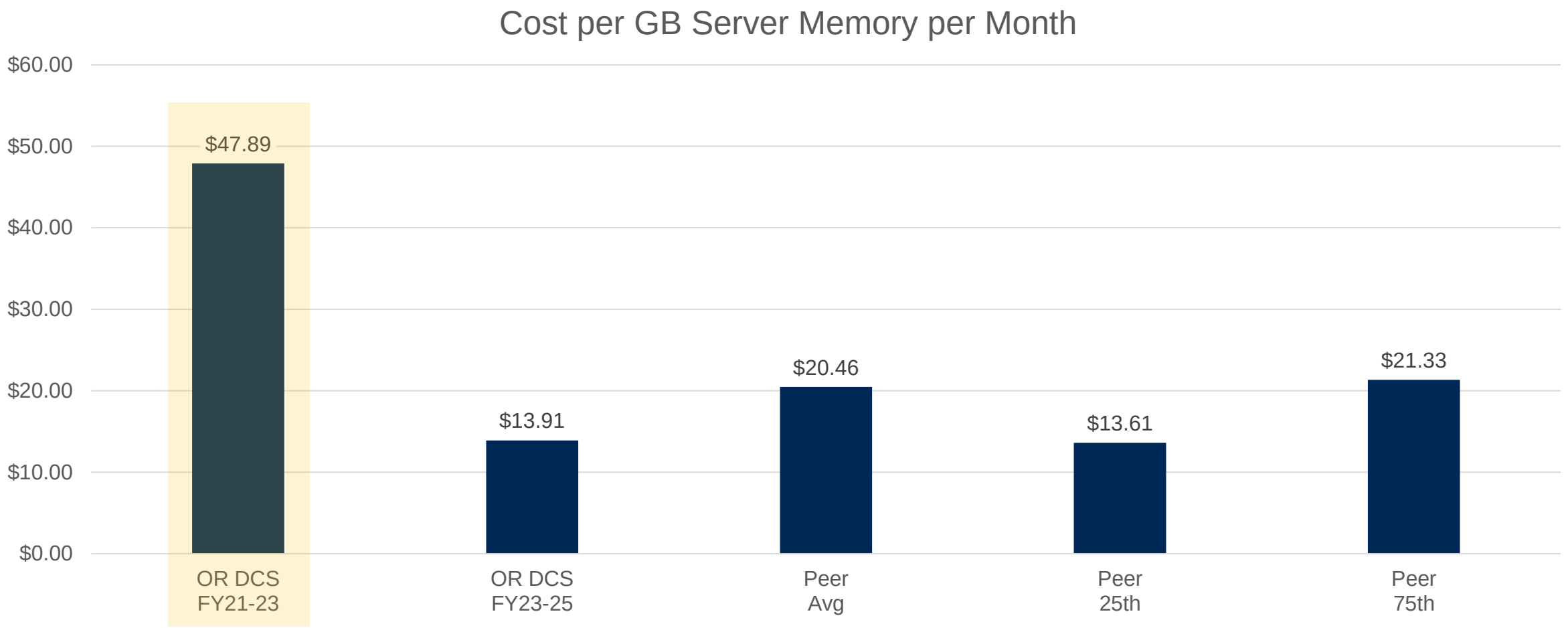
Midrange – Virtual Operating System Service – UNIX
Cost per UNIX Instance per Month



Midrange – System CPU Resource Allocation
Cost per Server Core per Month



Midrange – System Memory Resource Allocation
Cost per GB Server Memory per Month



Mainframe

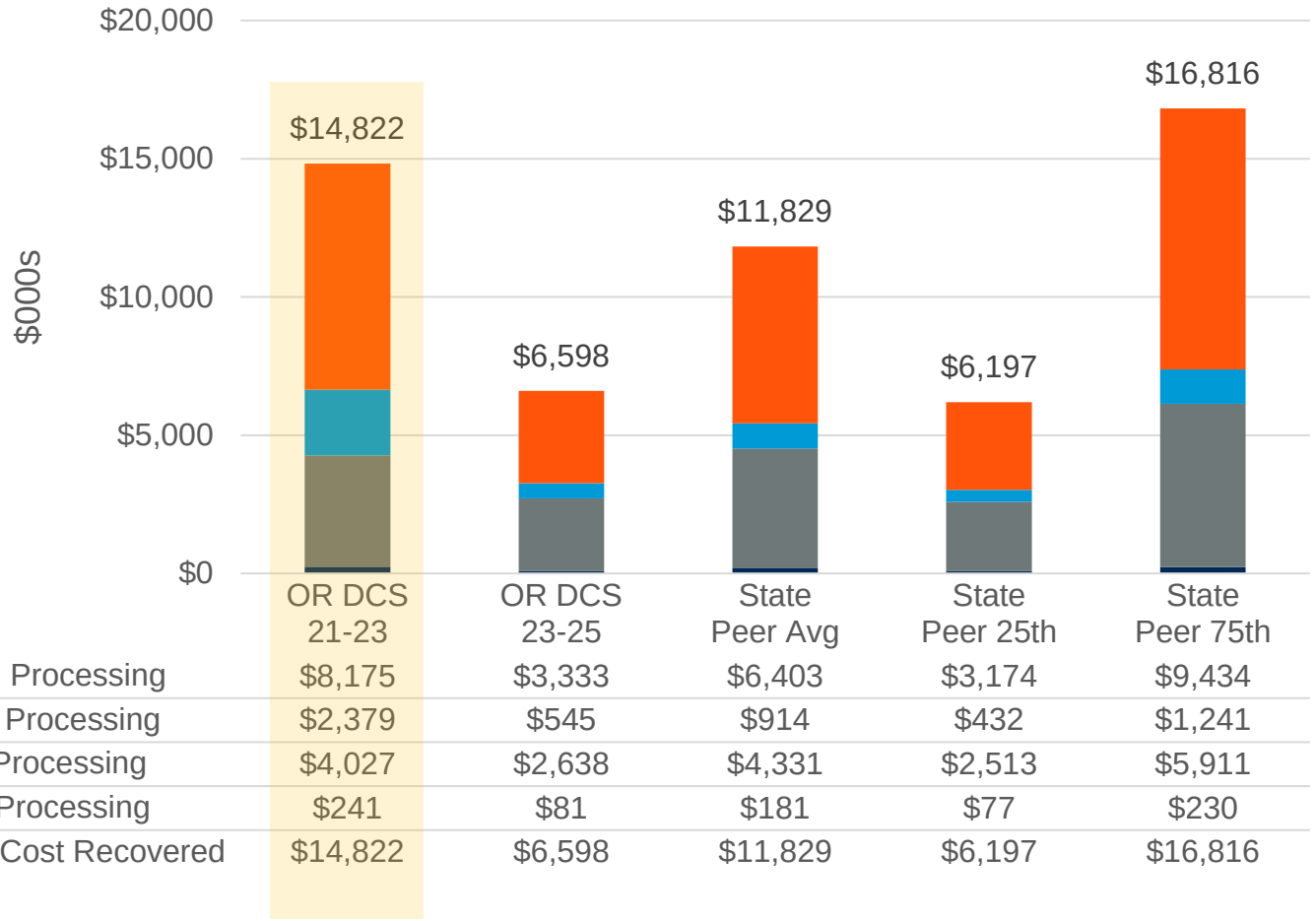
Mainframe Demographics

- DCS Demographics

Mainframe	Monthly Billed Units
Batch Processing	19,756
CICS Processing	2,140
DB2 Processing	7,669
TSO Processing	481

- Peer Demographics
  - 10 Government Organizations

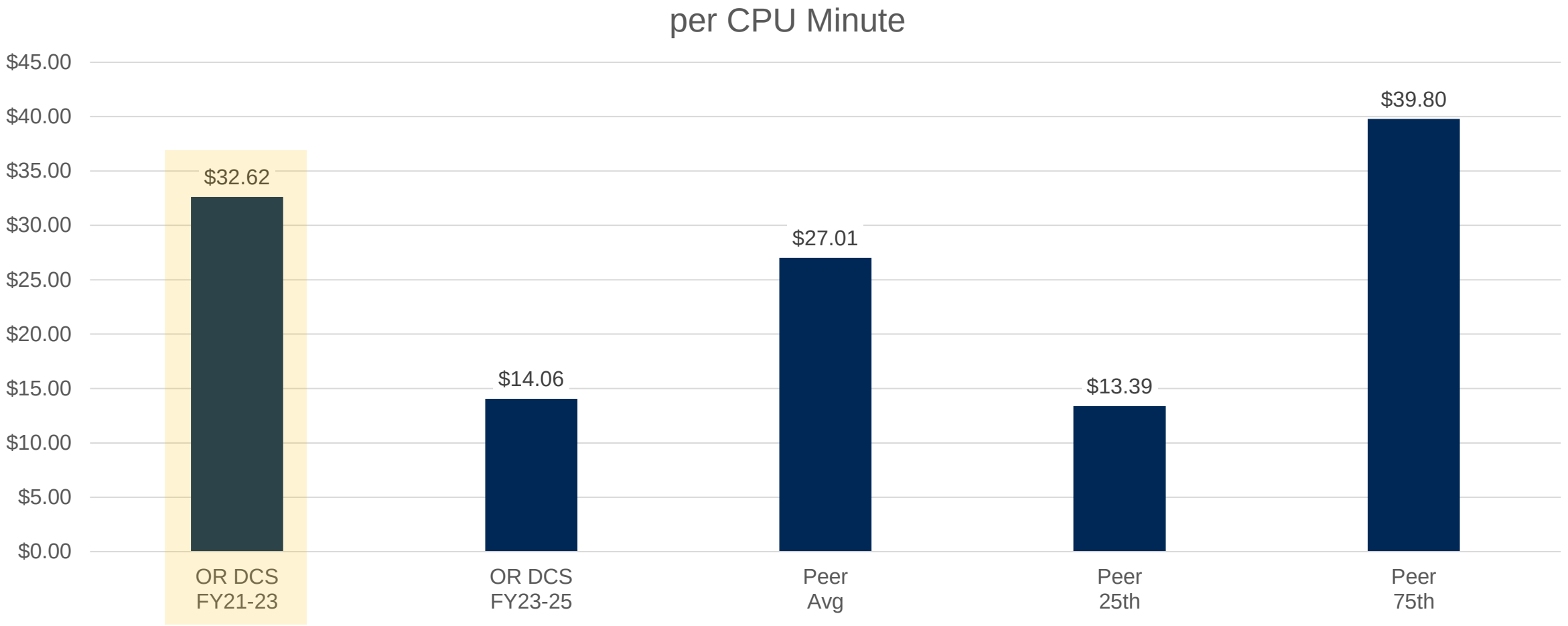
Mainframe
Annual Cost Recovered



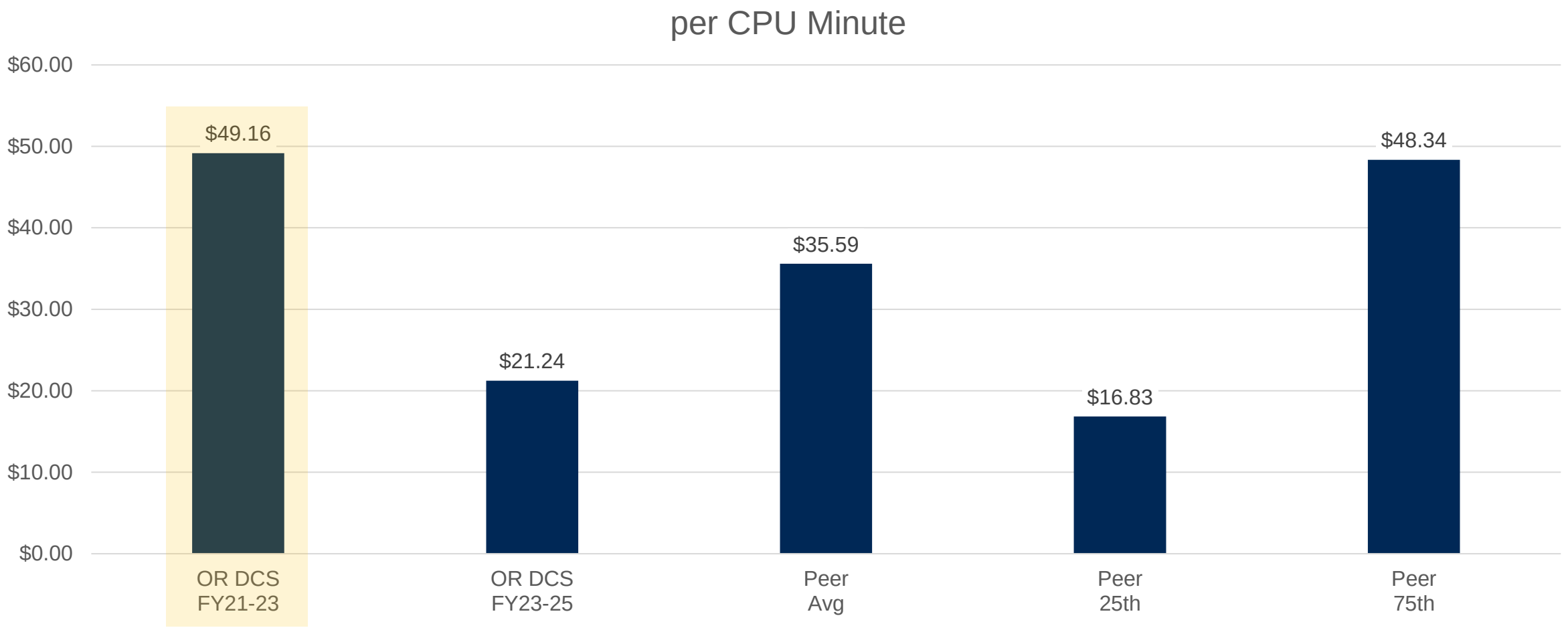
	OR DCS 21-23	OR DCS 23-25	State Peer Avg	State Peer 25th	State Peer 75th
Batch Processing	$8,175	$3,333	$6,403	$3,174	$9,434
CICS Processing	$2,379	$545	$914	$432	$1,241
DB2 Processing	$4,027	$2,638	$4,331	$2,513	$5,911
TSO Processing	$241	$81	$181	$77	$230
Total Cost Recovered	$14,822	$6,598	$11,829	$6,197	$16,816

- Total annual cost recovered by the Mainframe rates analyzed is $5.2M (44%) lower than peers would recover based on rates for the same billed volumes.
- Mainframe rates fell dramatically since the previous biennium. This is partially attributable to certain mainframe costs being removed from the rates and directly passed through to only the users of those resources.

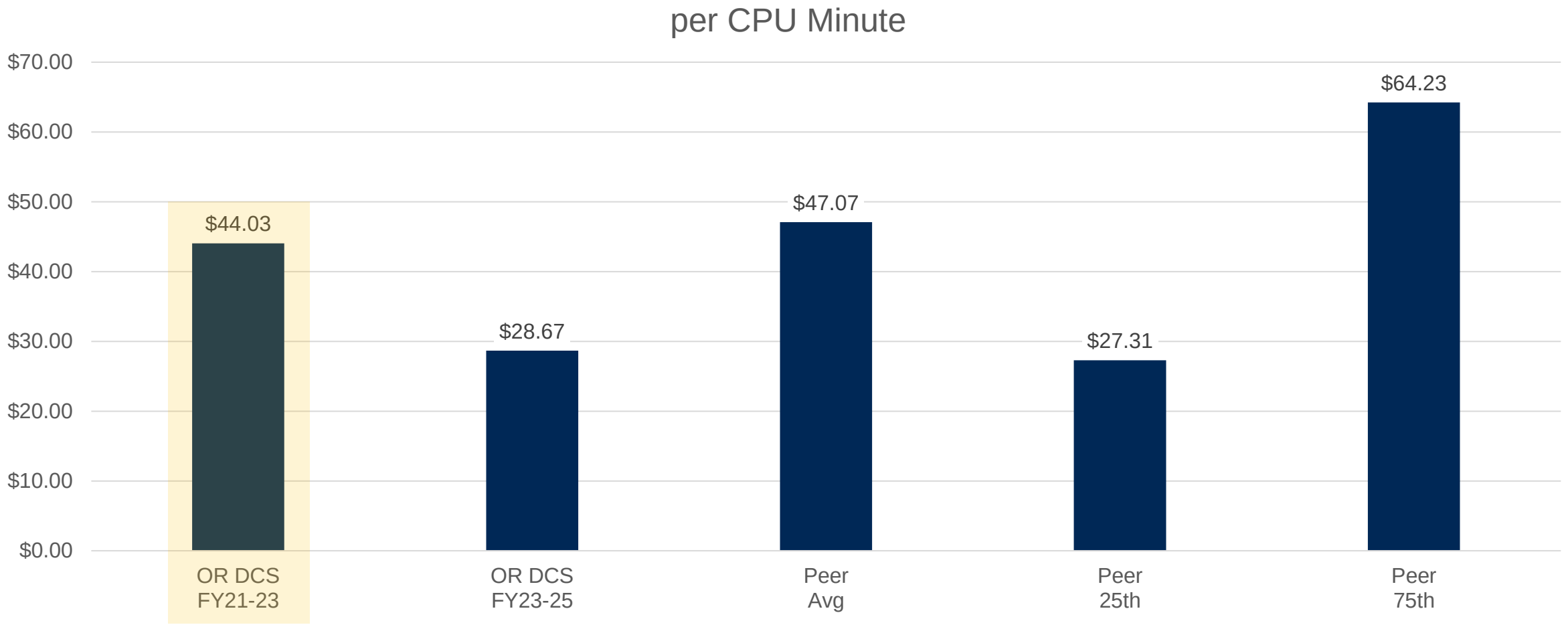
Mainframe – Batch Processing
Cost per CPU Minute



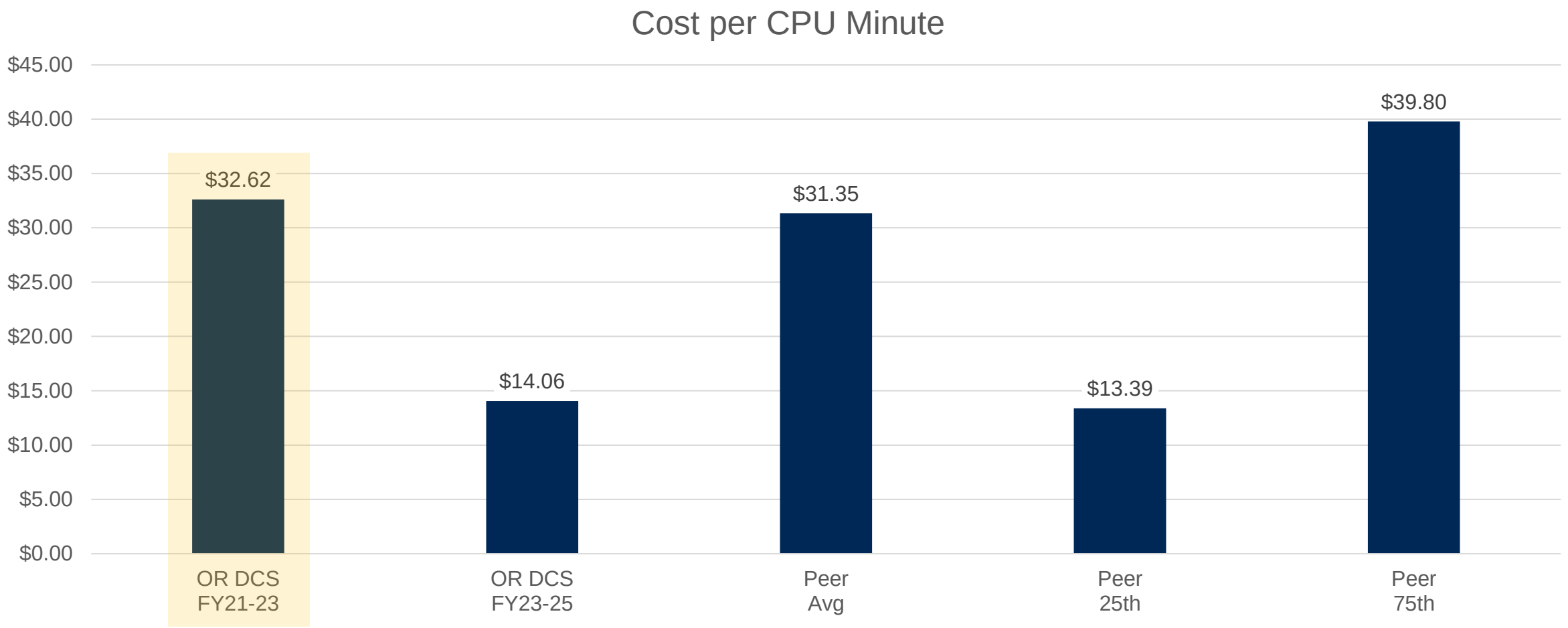
Mainframe – CICS Processing
Cost per CPU Minute



Mainframe – DB2 Processing Cost per CPU Minute



Mainframe – TSO Processing
Cost per CPU Minute



Storage

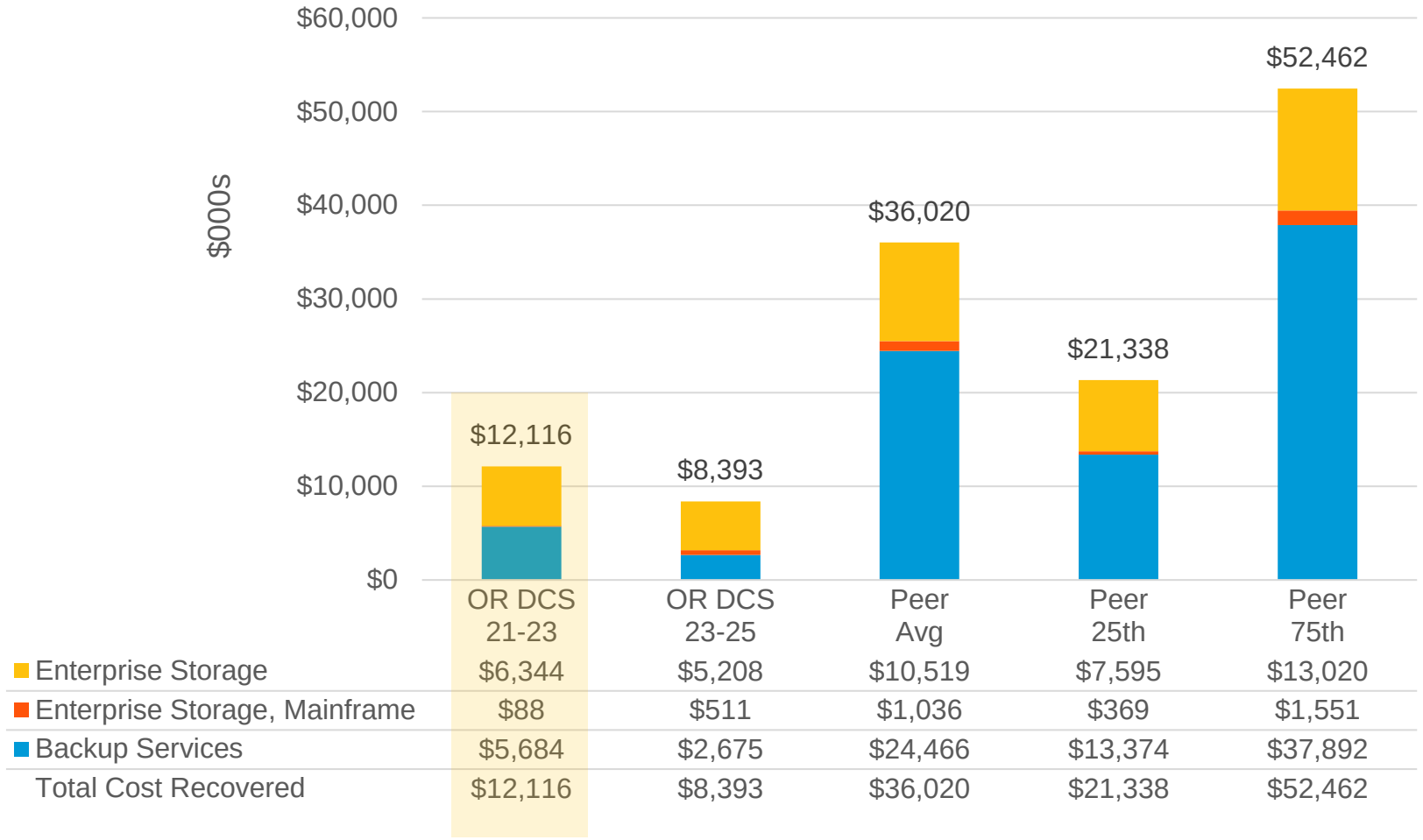
Storage Demographics

- DCS Demographics

Storage	Monthly Billed Units
Enterprise Storage	7,233,134
Mainframe Storage	23,326
Backup Storage	37,148,938

- Peer Demographics
  - Enterprise Storage
    - 19 Government Organizations
  - Mainframe Storage
    - 7 Government Organizations
  - Backup Storage
    - 11 Government Organizations

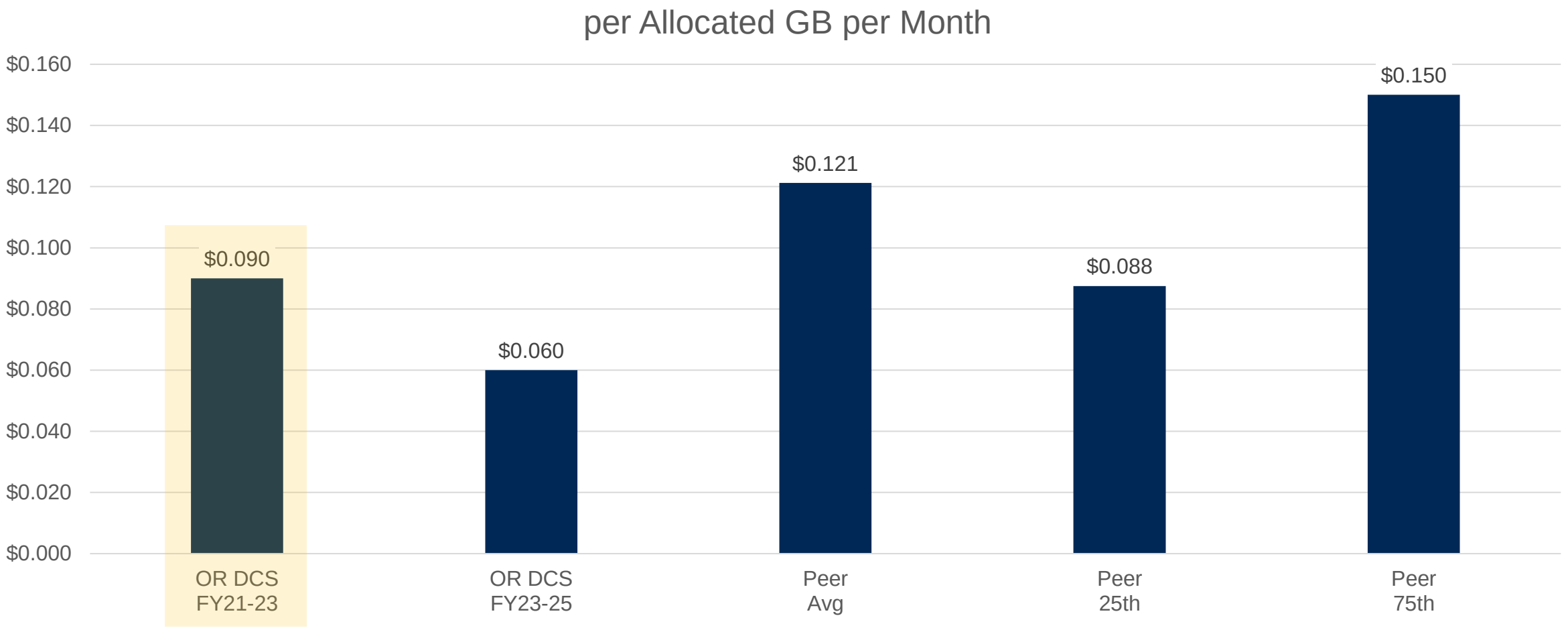
Storage
Annual Cost Recovered



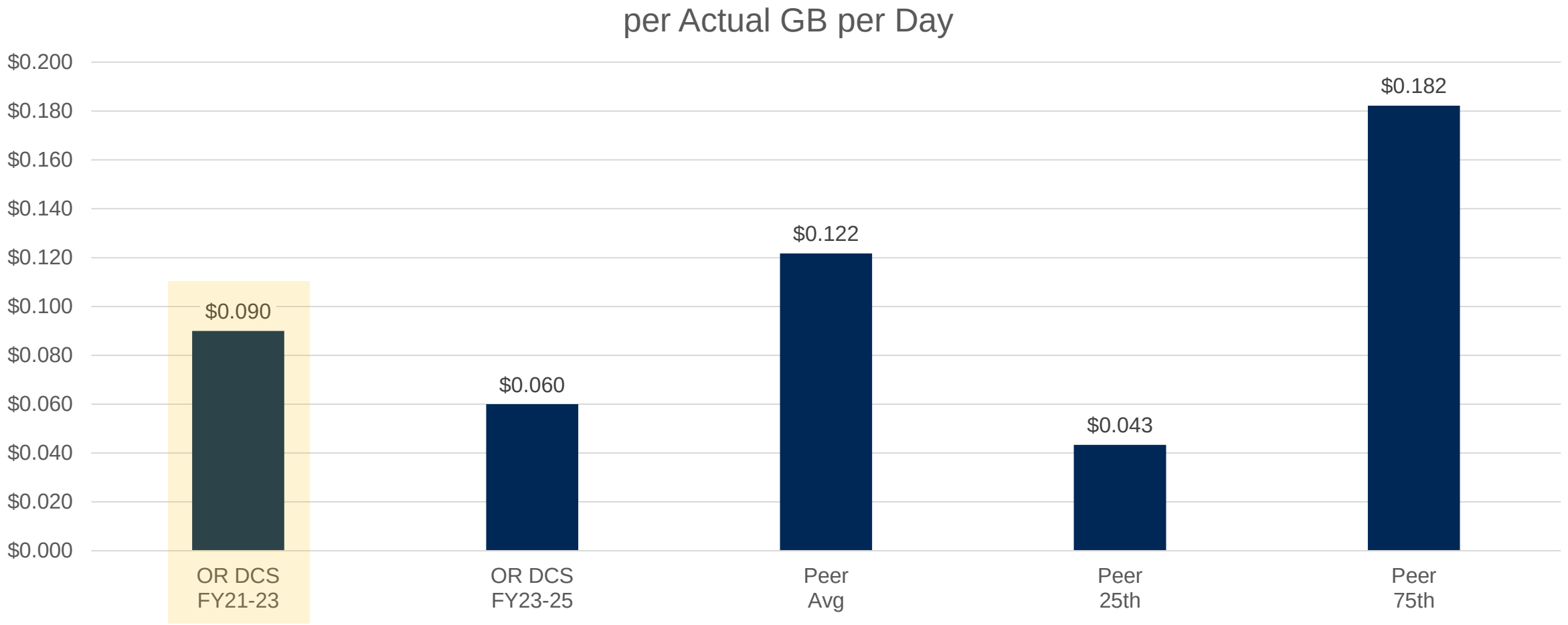
	OR DCS 21-23	OR DCS 23-25	Peer Avg	Peer 25th	Peer 75th
Enterprise Storage	$6,344	$5,208	$10,519	$7,595	$13,020
Enterprise Storage, Mainframe	$88	$511	$1,036	$369	$1,551
Backup Services	$5,684	$2,675	$24,466	$13,374	$37,892
Total Cost Recovered	$12,116	$8,393	$36,020	$21,338	$52,462

- Total annual cost recovered by the Storage rates analyzed is $27.6M (77%) lower than peers would recover based on rates for the same billed volumes.
- The biggest gap in rates is for Backup Services, where rates are 89% less than the peer average and 80% less than the peer 25th percentile.
- DCS is able to keep its Enterprise Storage rate low by:
  - Leveraging data de-duplication technology
  - Over-allocating resources based on historical patterns of customer demand compared to actual utilization.

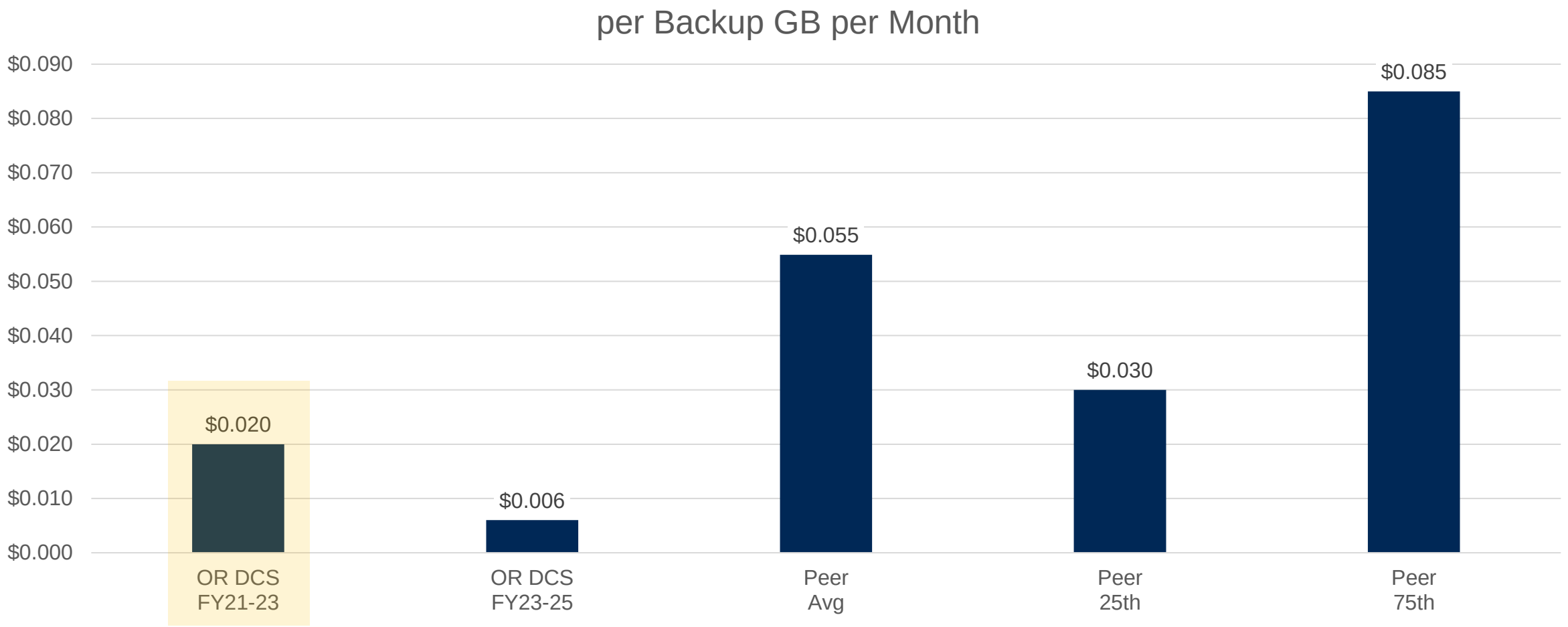
Storage – Enterprise Storage
Cost per Allocated GB per Month



Storage – Mainframe Storage Cost per Actual GB per Day



Storage – Backup
Cost per Backup GB per Month

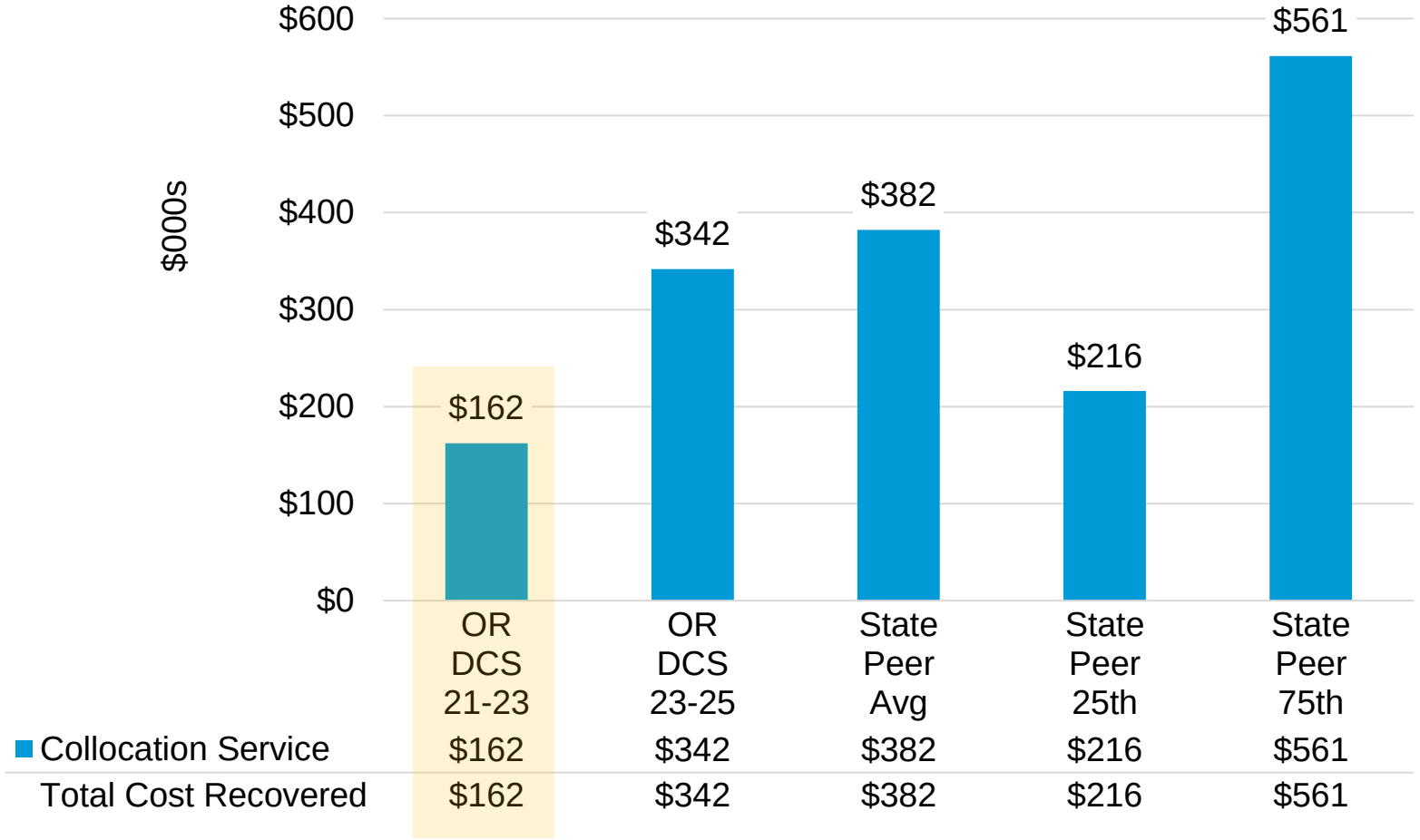


Colocation

Colocation Demographics

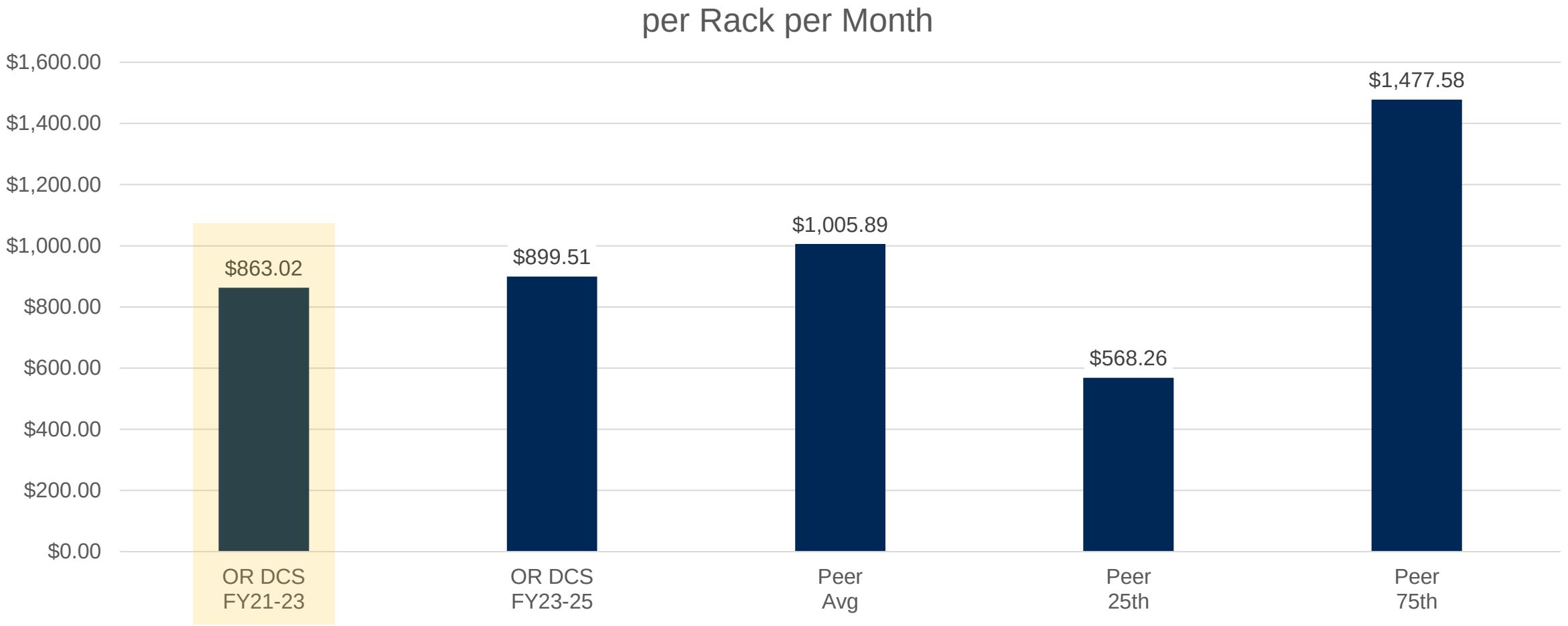
- DCS Demographics
  - 32 Racks
- Peer Demographics
  - 12 Government Organizations

Colocation Services
Annual Cost Recovered



- Total annual cost recovered by Colocation Services is 1% ($1.9K) less than peers would recover based on rates for the same billed volumes.
- The DCS Colocation rate fell slightly from the previous biennium.

Colocation
Cost per Rack per Month



Data Network

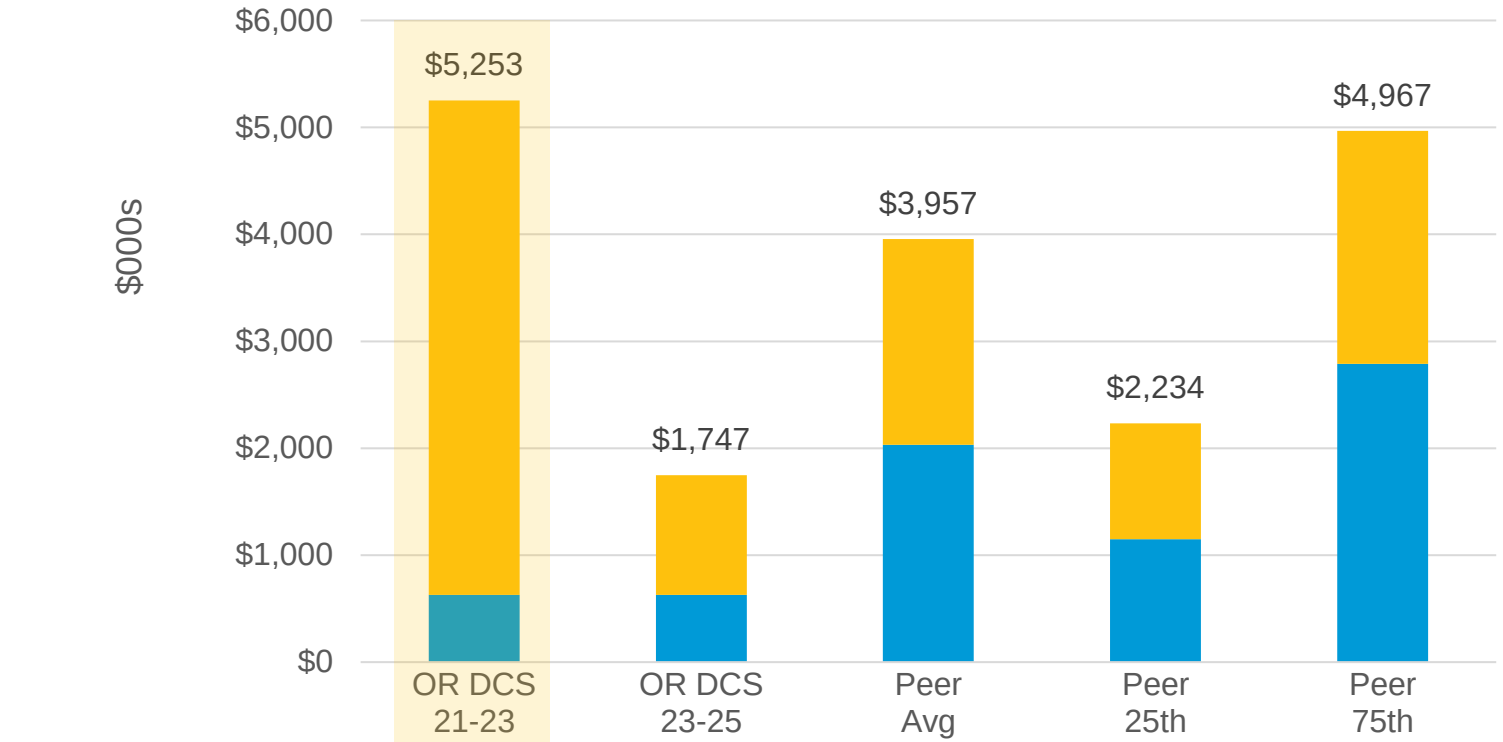
Data Network Demographics

- DCS Demographics

Data Network	Monthly Billed Units
22-Port Switch (Equivalent)	2,912
Wireless Devices	4,661

- Peer Demographics
  - LAN Services
    - 4 Government Organizations
  - Wireless Services
    - 7 Government Organizations

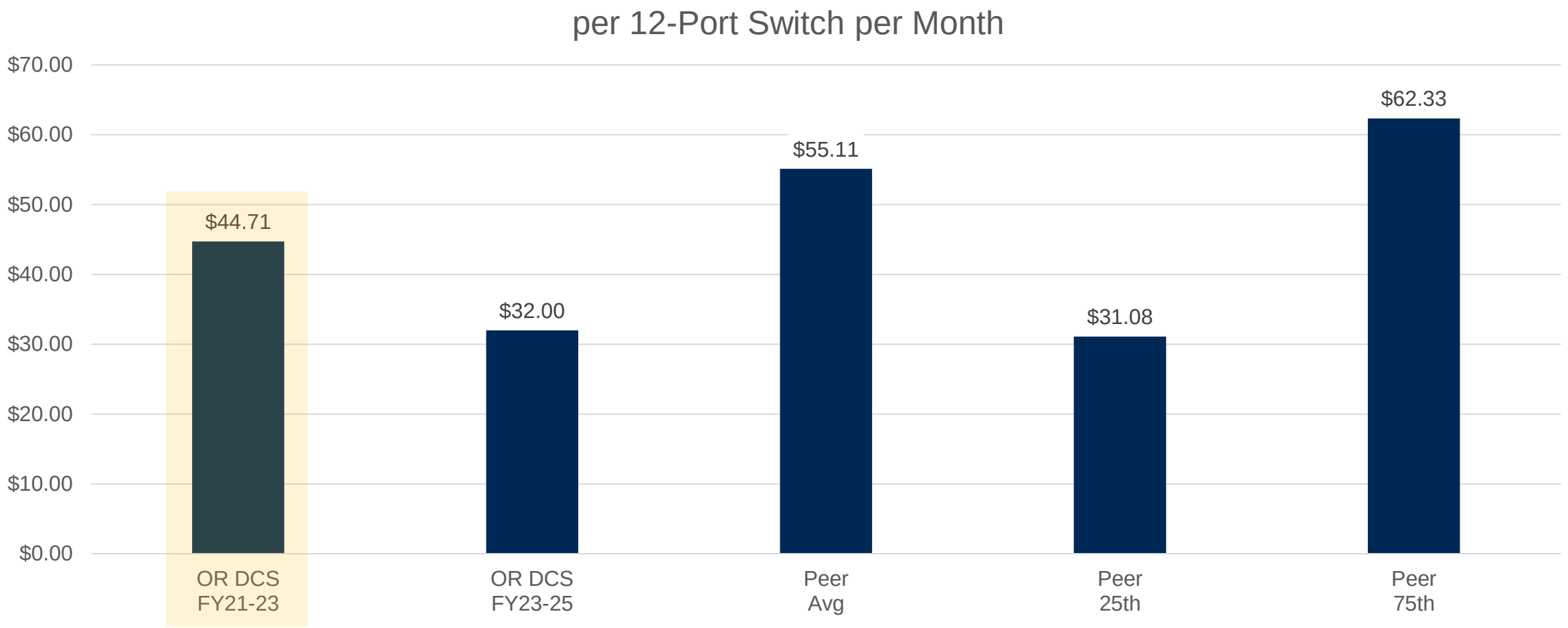
Data Network
Annual Cost Recovered



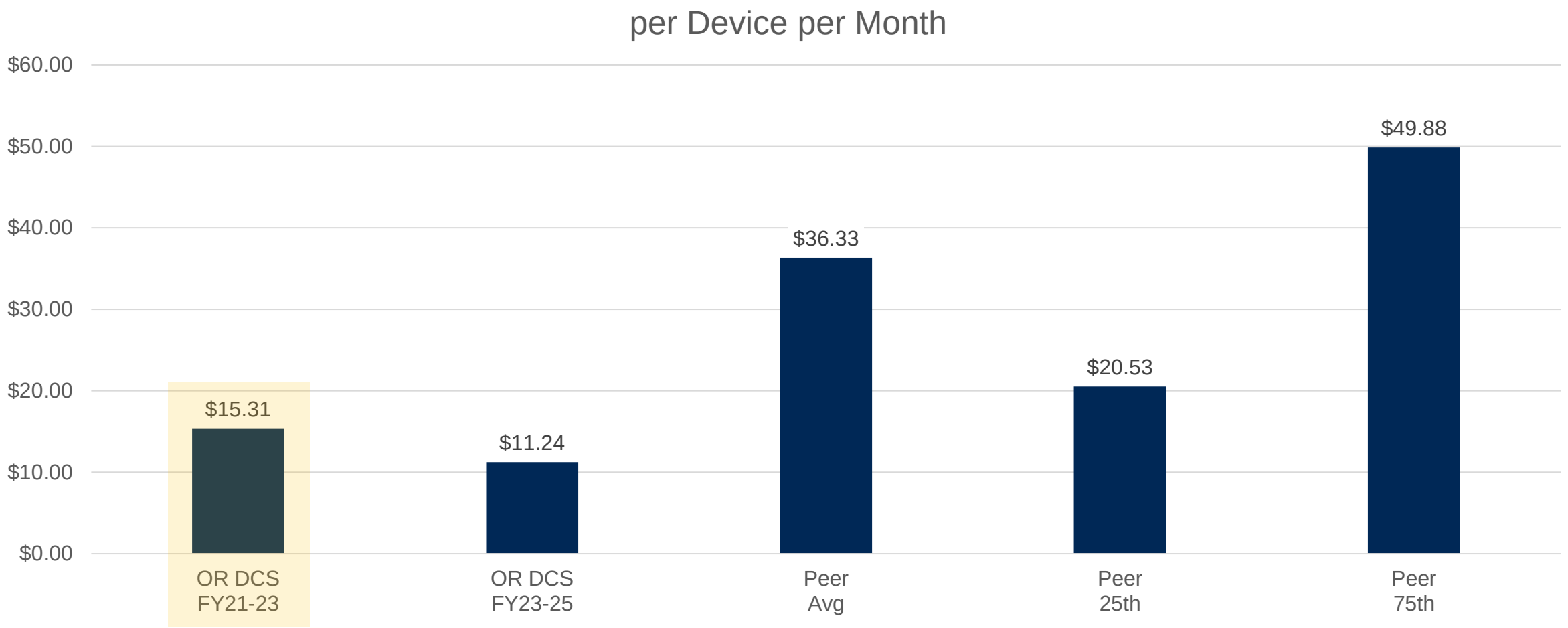
	OR DCS 21-23	OR DCS 23-25	Peer Avg	Peer 25th	Peer 75th
Enterprise Storage	$4,623	$1,118	$1,926	$1,086	$2,178
Backup Services	$630	$629	$2,032	$1,148	$2,790
Total Cost Recovered	$5,253	$1,747	$3,957	$2,234	$4,967

- Total annual cost recovered by Data Network Services is 56% ($2.2M) less than peers would recover based on rates for the same billed volumes.
- FY23-25 DCS rates are 28% and 27% less than FY21-23 rates for Wireless Services and LAN Services, respectively.
- States vary in rate structures for LAN wired and wireless services, with about half charging separately and half charging a combined rate.

Data Network – LAN Services
Cost per Server per 12-Port Switch per Month



Data Network – Wireless Services
Cost per Device per Month

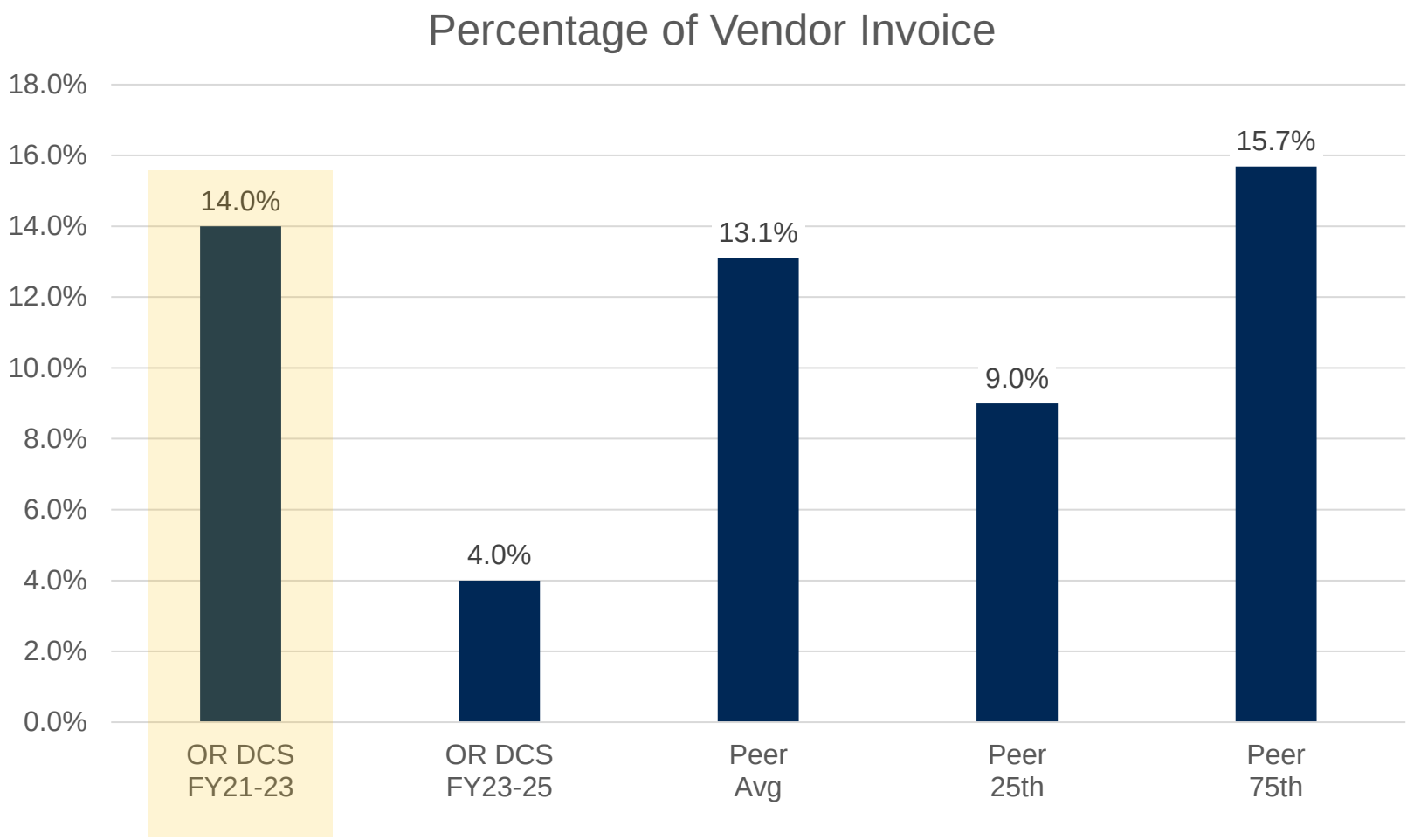


Cloud Services

Cloud Services Demographics

- Peer Demographics
  - 7 Government Organizations

Cloud Service Surcharge Percentage of Vendor Invoice



- Cloud surcharges range from a low of 8% to a high of 25% among the six state peers.
- DCS is currently utilizing a flat-rate percentage uplift to recover cloud implementation and management costs.
  - While this model is common, DCS could consider diversifying into a chargeback model with “levels” mapped to discrete services.

Appendix: Peer Comparisons

Peer Comparisons

- Peer group data in this analysis is drawn from other State Service Catalogs where services align with DCS offerings.
- Independent peer groups were selected for each service area.
- Cost metrics are displayed in comparison with three peer group reference points:
  - Peer – Avg: representing the average for the comparative group
  - Peer – 25th: representing the lowest quartile (most efficient) for the comparative group
  - Peer – 75th: representing the highest quartile (least efficient) for the comparative group
- Time periods compared in this analysis:
  - 2023-25 biennium will be based on 2023-25 rates and FY2024 (actual and estimated) billed units.
  - Peer total recoverable costs by service is calculated as the peer rate times DCS billed units.

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