

# Data Center Efficiency

## Fast Relief for the Overstressed Facilities

### Service Highlights:

- ✓ **Recover Capacity:** Delay an expensive data center relocation by recovering capacity from your existing facility
- ✓ **Support Growth:** Optimize power, cooling and layout for high density servers, storage and virtualization
- ✓ **Reduce Electricity Usage:** Reduce data center electricity usage by 25-35% without impacting IT servers and services
- ✓ **Conserve Cash:** Avoid band aid type upgrades to your facility that burn CAPEX and increase monthly OPEX
- ✓ **Reduce Maintenance:** Avoid expensive maintenance and repairs to power and cooling infrastructure
- ✓ **Green Facility:** Introduce high efficiency "carbon friendly" systems that have substantial ROI and payback in months
- ✓ **Sustainable:** Strike sustainable balance in data center operations between IT, Finance and Facilities

### Achieving Efficiency

Efficiency upgrade projects are rapid and low risk – having little to no impact on ongoing data center operations. Take advantage of local utility incentives and rebates to shorten the payback to just 4 to 12 months.

All data centers, even those with adequate power and cooling, will benefit from improved efficiency:

- Recover capacity for more IT systems
- Extend the useful life of the facility & assets
- Reduce OPEX with reduced electricity demand and equipment maintenance.

#### *TDS can help accelerate these savings:*

- Identify potential projects
- Optimize procurement by leveraging rebates and obtaining best pricing
- Plan and obtain best ROI & payback
- Build the business case to justify internal funding and approval

Data centers commissioned just 3-5 years ago are quickly becoming obsolete. On average, for every \$1 spent on electricity for IT systems, another \$1-\$2 is being spent to power support infrastructure. This ratio of total required power to IT load is referred to as Power Usage Effectiveness (or PUE).

While a PUE of 2.0 – 3.0 is typical in older facilities, a more efficient 1.3 PUE is attainable using fast-payback technology and utility rebates. Often 70% of such overhead infrastructure OPEX can be eliminated with rapid payback.

### POTENTIAL EFFICIENCY IMPROVEMENTS

Here are some of facility improvements available to most data centers:

- **VFDs:** The use and tuning of variable frequency drives (VFDs) can scale air and fluid flows as necessary based on demand and efficiency
- **Efficient Humidification:** Modern, ultrasonic humidification systems are 97% more efficient than steam based systems and can be installed in most facilities
- **Lighting:** While lighting only accounts for about 5 percent of data center power usage, higher-efficiency lighting with utility rebates offer rapid payback
- **Free Cooling:** When outside temperatures are cooler than the hot air return (based on daily and seasonal cycles), it will be more efficient / cheaper to exhaust the hot air and use the cooler outside air whenever possible
- **Rebates:** Equipment selection and procurement based on the highest efficiency and rebate potential to benefit CAPEX and OPEX
- **Rack Layouts:** Optimized to balance air flow and to minimize inefficient mixing of cold air source and hot air exhaust

Note: Although server and storage virtualization are highly recommended, we have intentionally excluded these improvements from this list. Virtualization is more of an IT optimization to be done in concert with application tuning and deployment.

### CASE STUDY

This 16,000 SF, Tier 3 data center in Boston was able to reduce their annual power requirements by 2,800 Megawatt hours. This was achieved by three infrastructure upgrade projects working in tandem to increase power and cooling efficiency—and resulted in savings of \$420,000 per year (based on \$.15 per KWh delivered).

Project:	VFD Pumps and Motors	Ultrasonic Humidification	High Efficiency Transformers
Turnkey Project Cost:	\$180,000	\$325,000	\$184,000
Utility Rebates:	\$135,000	\$190,000	\$82,000
<b>CAPEX:</b>	<b>\$45,000</b>	<b>\$135,000</b>	<b>\$102,000</b>
Power Reduction:	1,250 MW-h	1,050 MW-h	525 MW-h
<b>OPEX Savings:</b>	<b>\$185,000</b>	<b>\$156,000</b>	<b>\$79,000</b>
<b>Payback:</b>	<b>3 Months</b>	<b>10 Months</b>	<b>15 Months</b>

Inclusive of power company rebates, these three projects had a combined payback of 8 months. In addition to these savings, ultrasonic humidification alone reduced cooling requirements by 15% lowering cost and increasing capacity.

## Representative Customer Engagements

### Clients:

TDS clients include successful organizations of all sizes and focus who rely on TDS to operate transparently in their best interest.



Customer Type	Scale	Oversight	Efficiency	Site Selection	Plan / Design	Physical Move
Data Center - Atlanta, GA	100,000 SF	✓	✓	✓	✓	-
Data Center - Boston, MA	220,000 SF	✓	✓	✓	✓	-
Data Center - Calgary	60,000 SF	✓	✓	-	✓	-
Data Center - Houston, TX	50,000 SF	✓	✓	✓	✓	-
Data Center - London, UK	10,000 SF	✓	✓	✓	✓	-
Data Center - NYC	140,000 SF	✓	✓	✓	✓	-
Data Center - Tukwila, WA	100,000 SF	✓	✓	✓	✓	-
Enterprise Software	50 Servers	✓	-	-	-	✓
Financial Services	1,100 Servers	✓	-	✓	-	-
Financial Services	150 Servers	✓	-	-	✓	✓
Hospital - Los Angeles, CA	1,000 Servers	✓	-	-	-	✓
Hospital	300 Servers	✓	-	-	✓	✓
Hospital	125 Servers	✓	-	✓	✓	✓
Insurance	25 Servers	✓	-	-	✓	✓
Chemical - Dallas, TX	200 Servers	✓	✓	✓	✓	✓
Entertainment (Pro Sports) - MA	50 Servers	✓	-	✓	✓	✓
Entertainment - Tulsa, OK	200 Servers	✓	-	-	✓	✓
Retail - Miami, FL	1,000 SF	✓	-	-	✓	-
Web Portal - Employment - MA	1,200 Servers	✓	-	-	-	✓
Web Portal - General - VA	6,000 Servers	-	-	-	-	✓
Web Portal - Travel	50 Servers	✓	-	-	✓	✓

### About TDS:

Transitional Data Services provides independent assessments, recommendations and improvements for data center operation, design / build, relocation, management and technical operations.

With broad experience including a million SF of data centers – TDS helps companies navigate critical data center transitions.

- **Facility Efficiency Improvements:** TDS installed innovative air handling and humidification saving a data center over \$1M / year
- **Data Center IT Growth:** Doubled capacity of a "top 5 travel website" while reducing OPEX by 40% (relocation and upgrades)
- **New Facilities:** Built a Tier 3 class data center for a colocation provider in 12 months at \$1,200 / SQ FT and received \$453,000 in rebates from NSTAR for energy efficiency
- **Relocation Services:** Relocated thousands of devices over 15 move events for a major hospital with no unplanned outages
- **Site Selection:** Saved a F1000 manufacturer \$17M in data center relocation costs while accelerating move by 12 months

TDS can operate as an extension to your team providing advice and oversight for key projects, or take on full turnkey responsibilities.

A relationship with TDS typically begins as an assessment to help with strategic planning or execution readiness. This could be for facilities optimization, build / lease analysis or relocation readiness.

Through this assessment, analysis and planning, TDS will help your staff map out an execution plan that aligns with your resources and needs.

### Useful Web Links: (or visit [www.TransitionalData.com](http://www.TransitionalData.com))

- Network World: [What does a Green Data Center Look Like?](#)
- Interactive Video: [Internap Data Center – Green Features](#)
- Websites: [Transitional Data \(TDS\)](#), [Data Center Blog](#) on CIO
- White Paper: [Beware of the Power Density Paradox](#)
- White Paper: [5 Steps for Successful Data Center Relocation](#)
- CIO.com: [5 Pitfalls of Data Center Consolidation](#), On [MP3](#)