



Alaska Department of Transportation and Public Facilities

Long-Range Transportation Plan Data Refresh

September 1, 2010
Updated December 3, 2010

Alaska Department of Transportation and Public Facilities

Long-Range Plan Refresh

Data Update Report

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**Alaska Department of Transportation and
Public Facilities (ADOT&PF)**

**Let's Get Moving 2030:
Alaska Statewide Transportation Policy Plan
2009 Data Element Refresh and Implementation**



I. Project Background

Let's Get Moving 2030 was approved in February 2008 by ADOT&PF Commissioner Leo von Scheben. Recommended strategies and actions in the plan were based on data tabulated through 2006. ADOT&PF tasked Dye Management Group, Inc. to review updates to data in 2007 and 2008 to present an updated view of construction cost fluctuations and the impact of economic stimulus funding on Alaska's transportation infrastructure. Other tasks included identifying anticipated national performance measures and recommending a reporting strategy for ADOT&PF, as well as reviewing the status of strategies and actions recommended in *Let's Get Moving 2030*.

A. Summary

ADOT&PF's revenues have increased, but so have the needs. The increase in needs has been higher than increased revenues, and the gap between needs and revenues has grown wider. The increased needs are primarily a result of construction cost escalation and deterioration of asset conditions. The highways and bridges are in worse shape than in 2007, but the airports are in better condition. The biggest increase in revenues was in General Fund revenues. The actual end of year balance of the Highway Trust Fund, a major source of revenue for ADOT&PF has been decreasing over the years and is anticipated to follow that trend over the coming years. No updated data was available for Green House Gas emissions, transit, or AMHS condition.

B. Data Update and Information

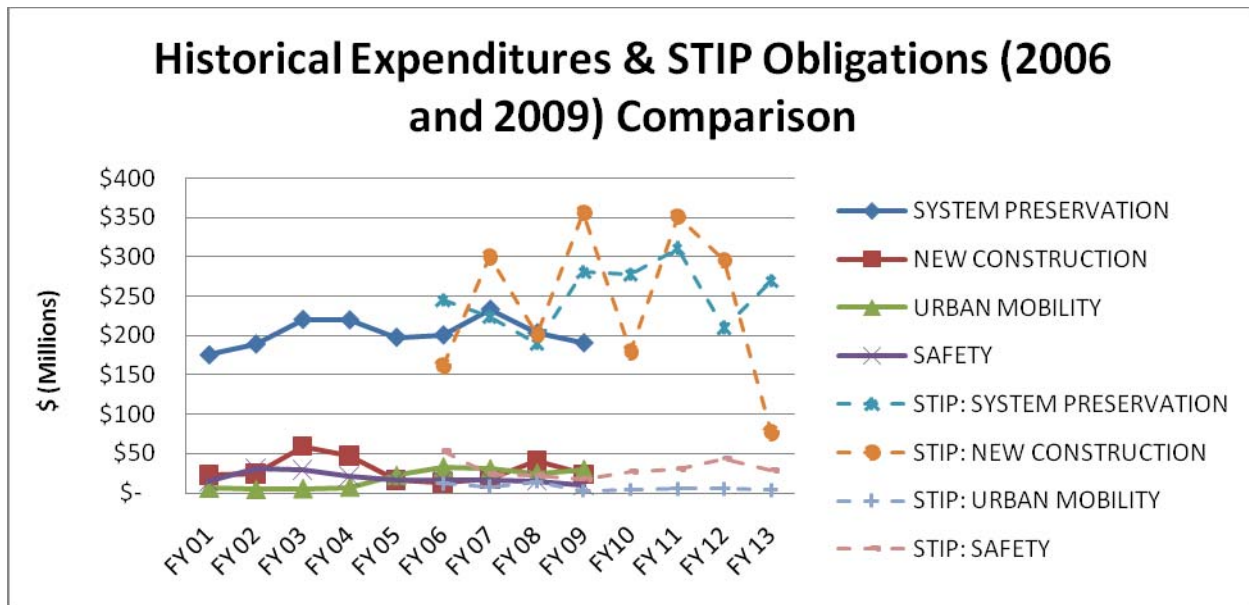
1. Statewide Transportation Improvement Program (STIP) Data Update

ADOT&PF is increasing its allocations to safety and system preservation, while reducing new construction allocations. Overall, this indicates that the fund allocations are following the strategies and actions identified in *Let's Get Moving 2030*.

Exhibit 1 below presents actual expenditures between FY 2001 and FY 2009, as well as STIP obligations between FY 2006 and FY 2013.

Note: The actual obligation for new construction, for FY 2007 was \$649.86 million. This number has been adjusted down in the attached chart to allow for easy reading of other data presented here.

Exhibit 1: STIP Update



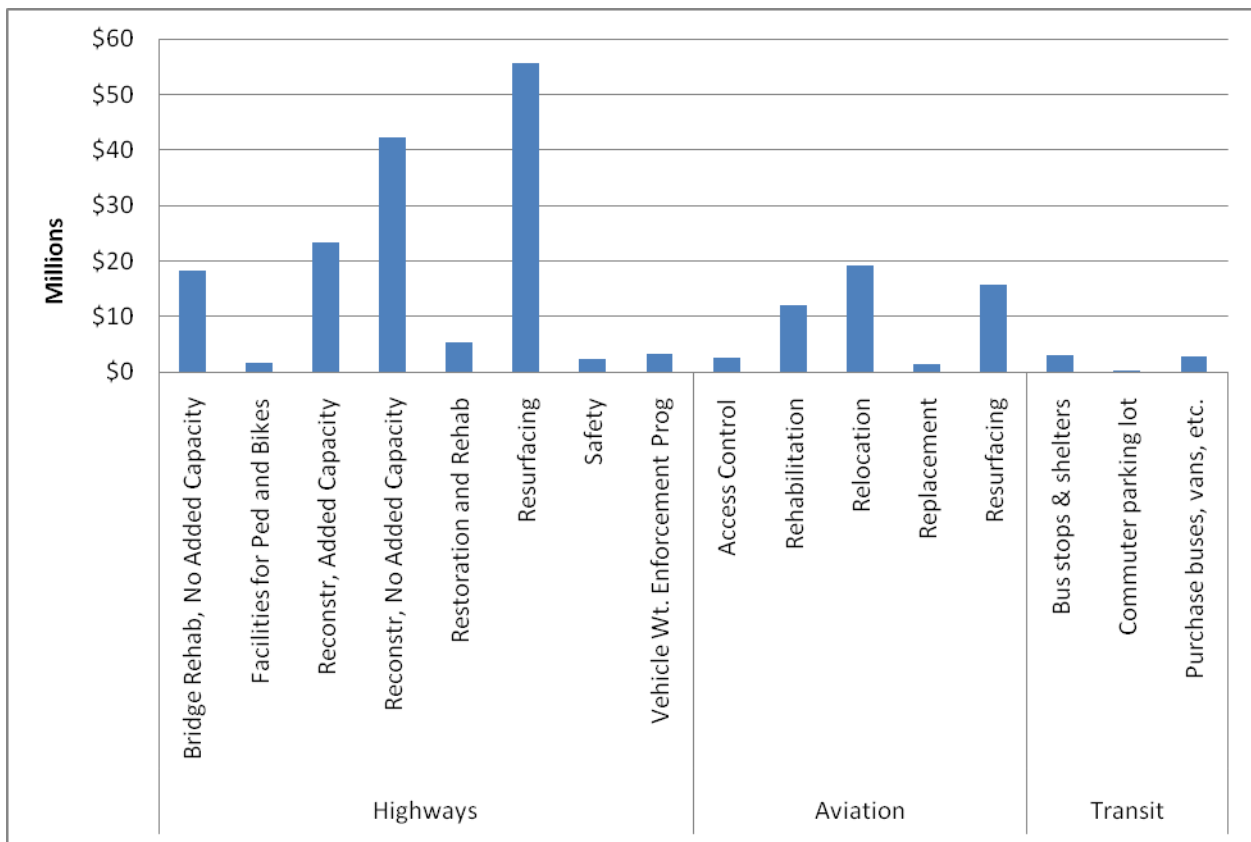
2. Stimulus Projects Update

On February 13, 2009, Congress passed the American Recovery and Reinvestment Act of 2009 in response to the economic crisis.

The Recovery Act made \$275 billion available for federal contracts, grants, and loans. Construction and repair of roads and bridges as well as scientific research and the expansion of broadband and wireless services are also included among the many projects that the Recovery Act will fund.

ADOT&PF received about \$154 million of these funds for new construction and other construction activities. Exhibit 2 below presents the list of projects funded by ADOT&PF by work type. The data indicates that ADOT&PF obligated most funds on reconstruction activities, followed by transit. This spending pattern is consistent with the goals set in *Let's Get Moving 2030*.

Exhibit 2: List of Stimulus Projects by Work Type



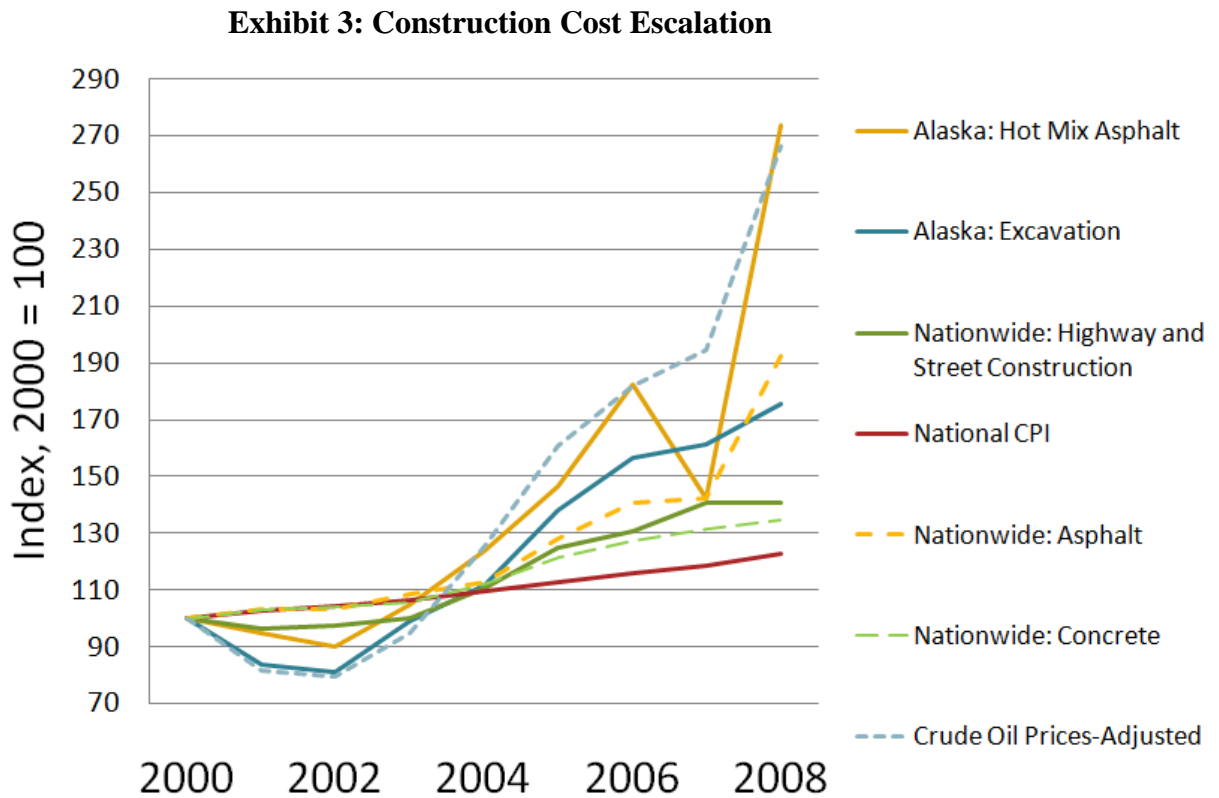
3. Construction Cost Escalation data update

The construction cost escalation data, first presented at the Transportation Stakeholder Group (TSG) meeting for the long-range plan in 2007, was one of the exhibits that concisely showed the severity of funding problems exacerbated by increases in construction costs. An update to the original data presented in Exhibit 3 below indicates that the rate of cost escalation in Alaska continues to be higher than the rest of the country by a significant amount.

For example, the cost of Hot Mix Asphalt (HMA) has increased by about 90% nationwide over the last eight years, while the cost of HMA in Alaska has increased by about 170%. HMA costs in Alaska have increased by almost 150% from 2006 to 2008. The analysis indicates that HMA costs follow the crude oil prices more closely in Alaska than nationwide.

Construction cost escalation in Alaska as well as the rest of the country has significantly outpaced inflation, especially since 2004.

With the economic recession in 2009, crude oil prices have also decreased and it is anticipated that HMA unit costs will be lower for Alaska in 2009 as compared to 2008.



4. Highway Needs Update

In order to update highway needs, Dye Management Group, Inc. reviewed the system development needs and life cycle management needs. The highway needs presented below include both roadways and bridges.

System Development Needs

Dye Management Group, Inc. reviewed updates to regional and MPO plans as well as STIP updates to revise system development needs. Furthermore, needs from the 2007 plans that were not revised through plan updates were inflation-adjusted to account for additional years passed.

A review of regional and MPO plans indicated that:

The Anchorage bowl Long-Range Transportation Plan (LRTP) was updated in April 2007.

Fairbanks Metro 2035 (LRTP) was adopted in July 2010
<http://dot.alaska.gov/nreg/planning/fmats/metro-trans-plan.shtml>¹

The Interior Alaska Transportation Plan is completed except for final adoption.

The Western Alaska Access Planning Study completed in 2010 further defined the “Yukon River Highway” concept explored in the 2004 Northwest Arctic Transportation Plan and identified a preferred route and sequence.
http://www.dot.state.ak.us/comm/pressbox/arch_2010/PR10-2579.shtml

Foothills West Transportation Access project completed an interim corridor analysis in May 2010. <http://foothillsroad.alaska.gov/>

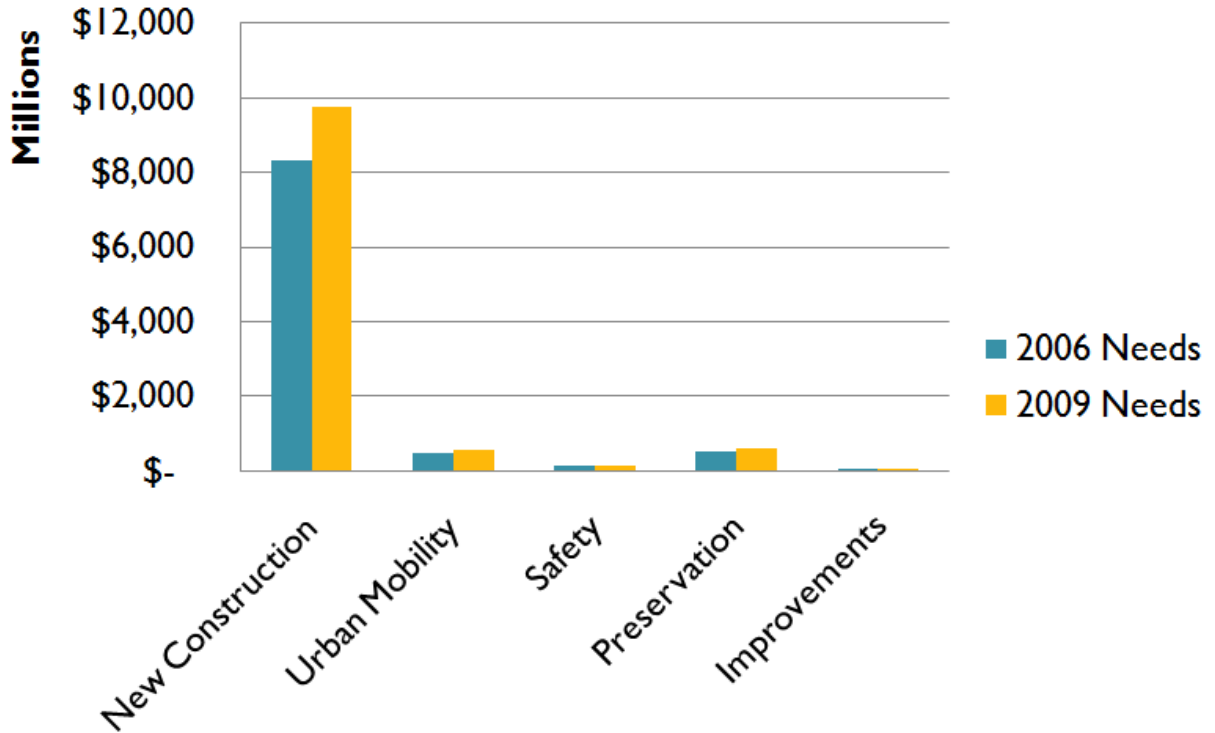
The Southwest Alaska LRTP will be undergoing an update starting November 2010 with estimated completion June 2013

Following the approach used in 2007 LRTP needs analysis, needs from un-adopted plans were not included in the system development needs.

Updated calculations indicate that system development needs increased from about \$12.7 billion to about \$13.6 billion. This increase is primarily due to the inflation adjustment applied to existing needs. Exhibit 4 below presents a breakdown of these needs by needs categories.

¹ The needs presented in the updated plan are fiscally constrained, and have been reduced to stay within a reasonable fiscal expectation. The needs shown in this report have not been updated to match the newest plan to clearly depict the magnitude of budget shortfall.

Exhibit 4: Highway System Development Needs Update



Life Cycle Management Needs

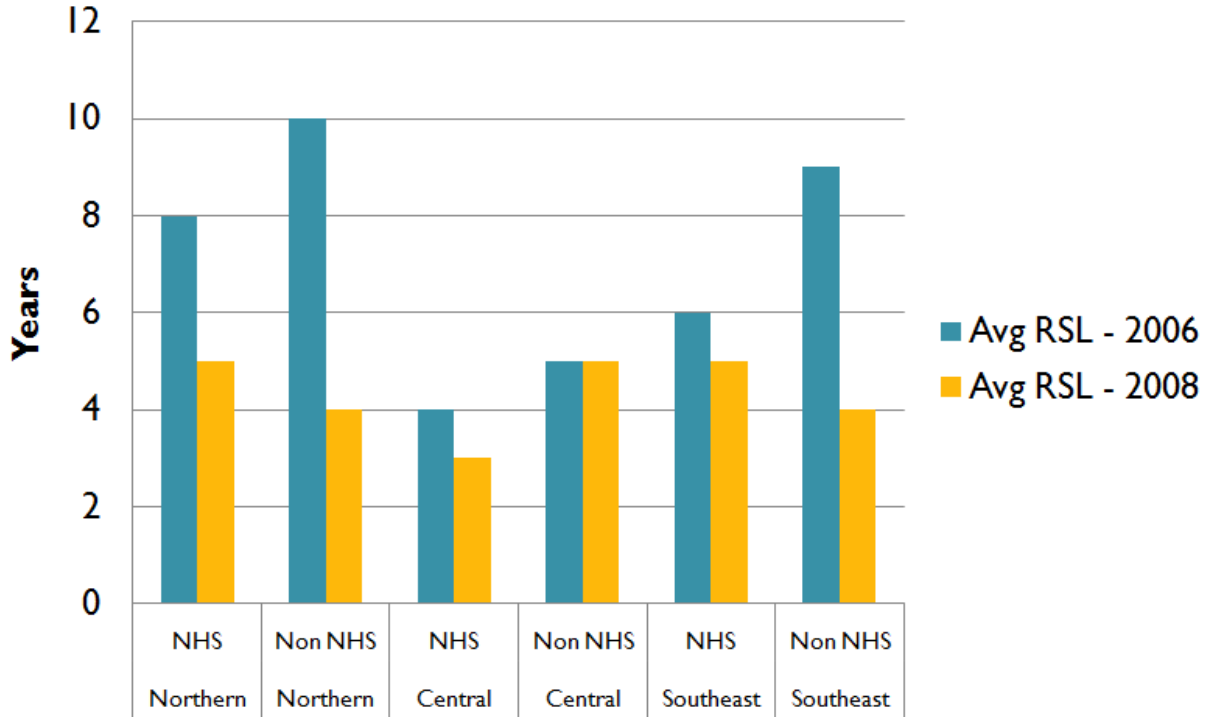
Dye Management Group, Inc. updated the life cycle management needs by obtaining current condition data as well as any treatment data on paved roads. No updates were made to unpaved roads since Alaska does not measure conditions for unpaved roads.

Dye Management Group, Inc. analyzed this data to determine whether the road conditions had overall improved or degraded and updated the needs.

Exhibit 5 below presents the average remaining service life by each region, further broken down by on-system and off-system roads.

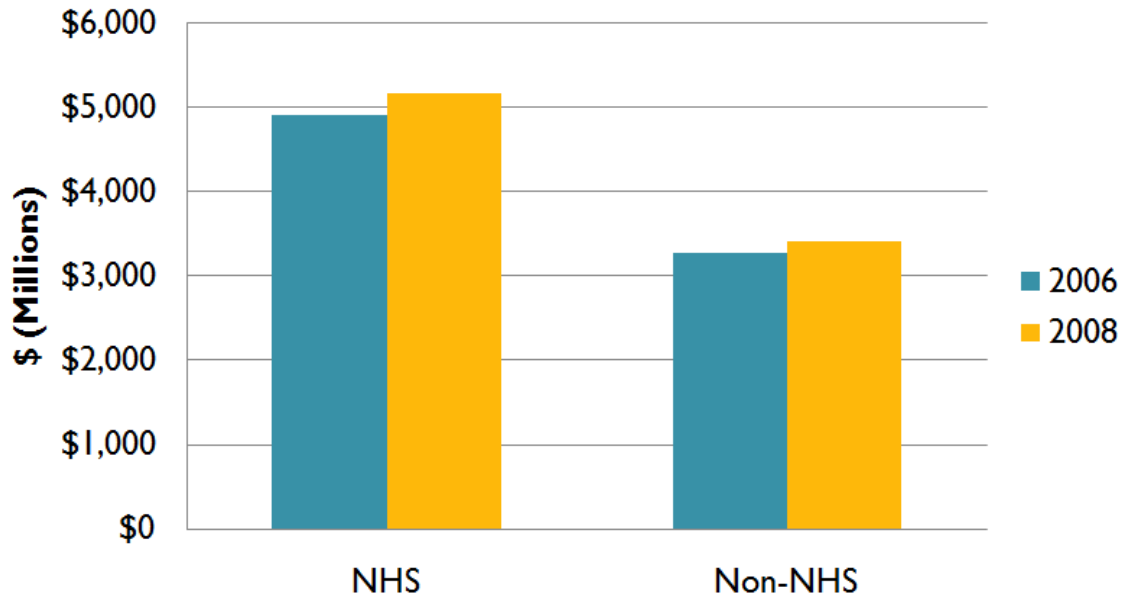
The data indicates a significant discrepancy in Remaining Service Life (RSL) data gathered by ADOT&PF in 2006 and 2008. Data analysis as well as conversations with staff members indicates that this discrepancy is probably caused due to differences in how RSL was calculated those years. ADOT&PF has better systems in place to measure RSL, and Dye Management Group, Inc. believes that the 2008 data may be more accurate.

Exhibit 5: Remaining Service Life Comparison



A comparison of needs between 2006 and 2008 data (the latest data available at time of this report) indicates that life cycle management needs have increased. Allocating more funds to preservation projects will be critical to avoid significantly increasing life cycle management needs over time.

Exhibit 6: Maintenance Total Life Cycle Needs Comparison



A detailed breakdown of needs by regions indicates that the needs have increased for Northern and Central regions, but have decreased for the Southeast region.

Exhibit 7: Maintenance Total Life Cycle Needs Comparison

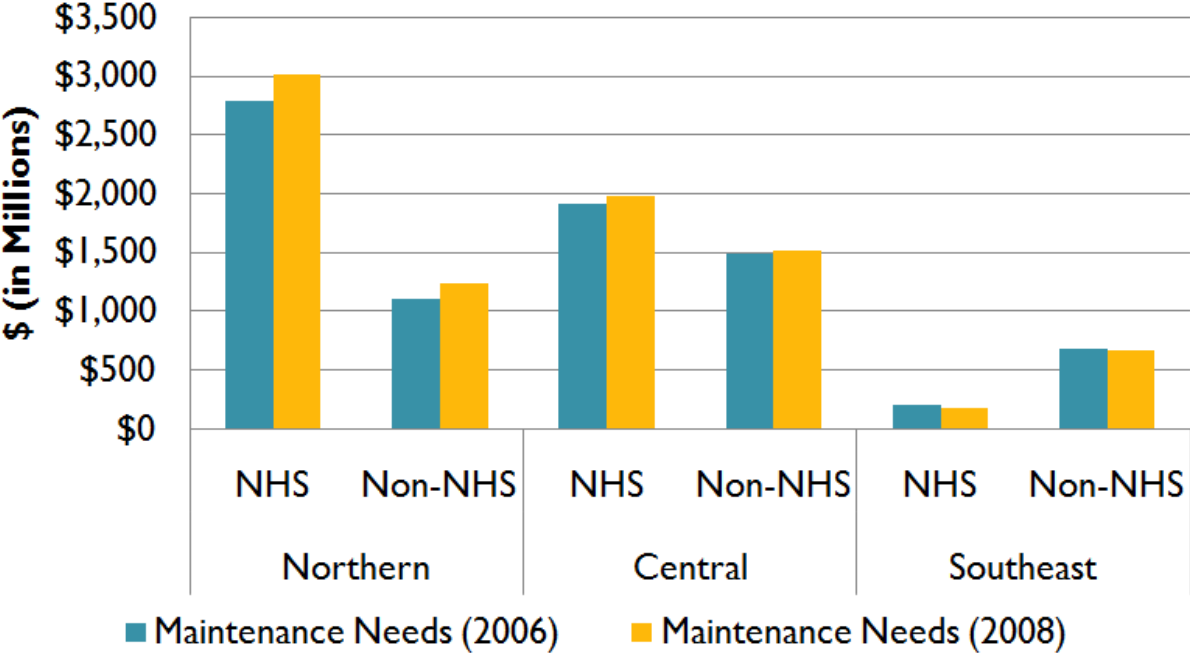
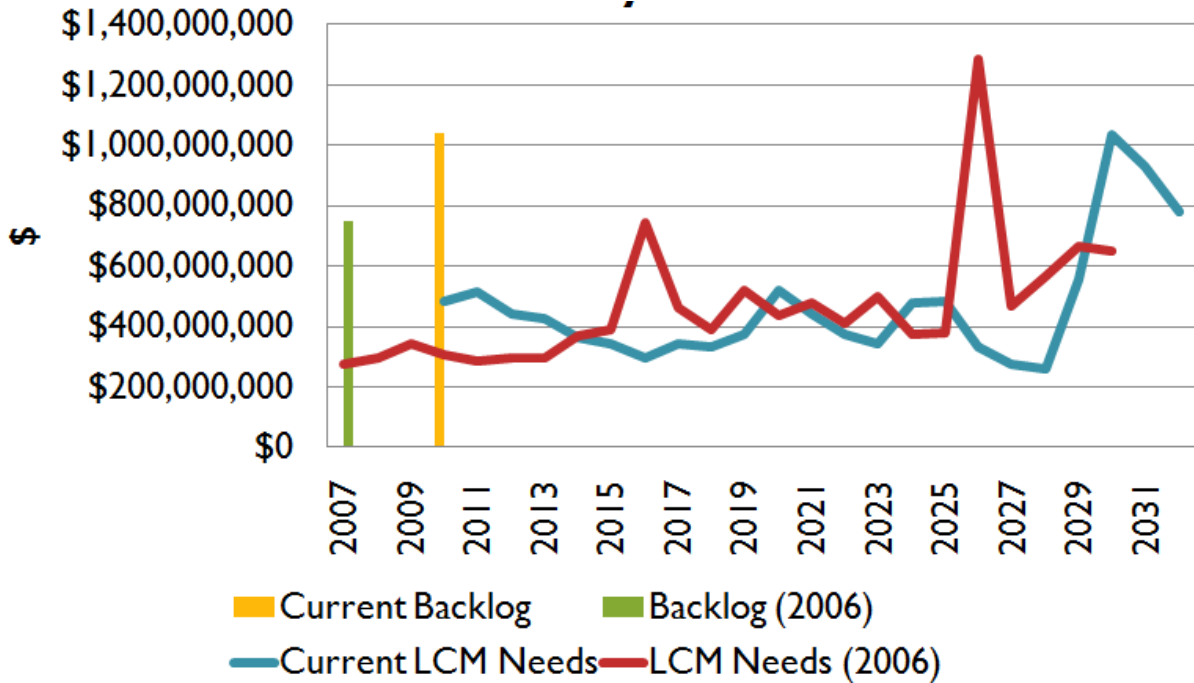


Exhibit 8 below presents the year-by-year needs calculated using the life cycle management needs model developed by Dye Management Group, Inc. As the data indicates, the current backlog of needs (roads in dire need of preservation) has increased from about \$750 million to about \$1 billion. The overall life cycle management needs increased from about \$8.18 billion to about \$8.58 billion.

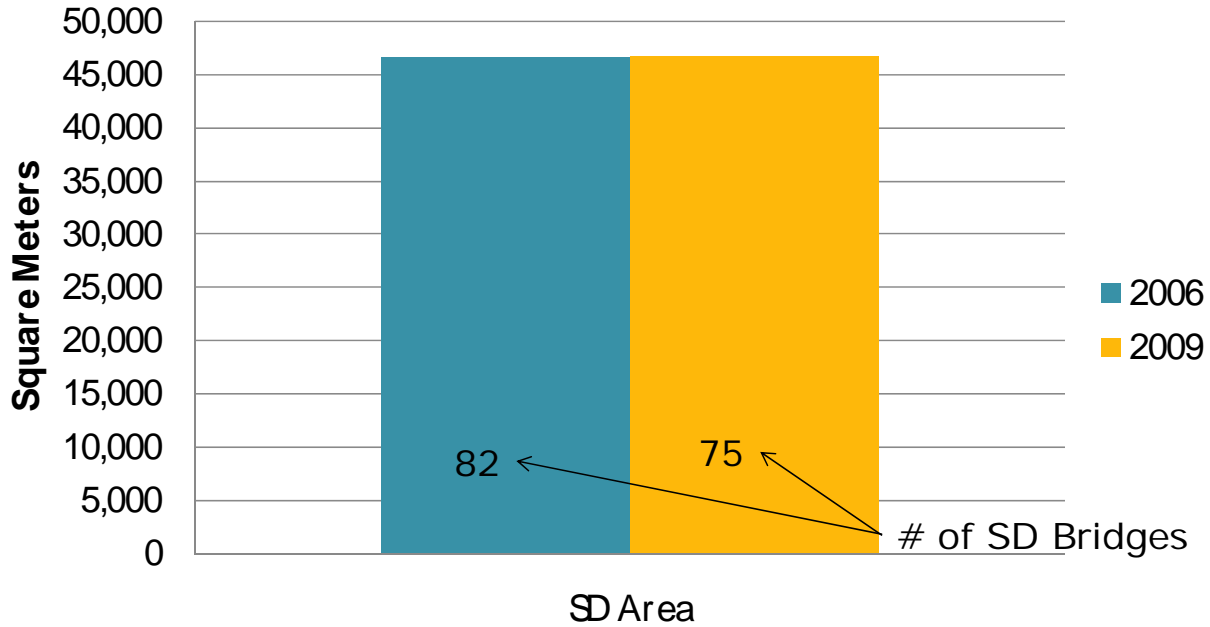
Exhibit 8: Maintenance Life Cycle Needs



Bridge Life Cycle Management Needs

The bridge life cycle management needs were updated by updating the bridge life cycle management model that was prepared as a part of *Let's Get Moving 2030*. As a part of the update, the project team first obtained updated bridge conditions from ADOT&PF. This data, as presented in Exhibit 9, indicates that the number of structurally deficient bridges owned by ADOT&PF reduced from 82 to 75, while the area of structurally deficient bridges increased slightly from 46,607 square meters to 46,799 square meters.

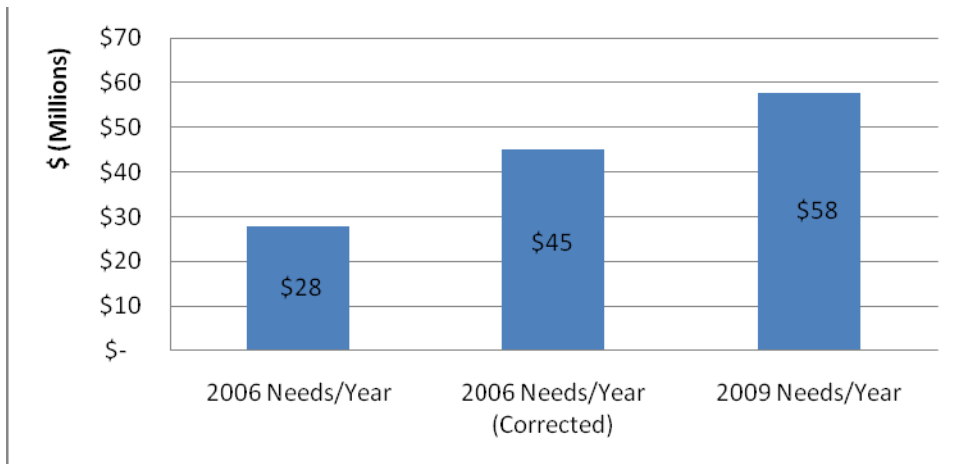
Exhibit 9: Bridge Condition Data – Structurally Deficient Bridges



During the analysis and quality assurance process, Dye Management Group, Inc. identified an error in the model which affected the needs analysis presented in *Let's Get Moving 2030*. Revising the 2006 needs indicated that the corrected average 2006 needs were \$45 million versus the initially reported \$27.68 million per year.

Needs analysis using 2009 condition data indicates that the average needs per year have increased to about \$57.55 million as presented in Exhibit 10.

Exhibit 10: Bridge Life Cycle Management Needs Comparison



5. Airport Needs Update

For airports, Dye Management Group, Inc. reviewed both system development and life cycle management needs.

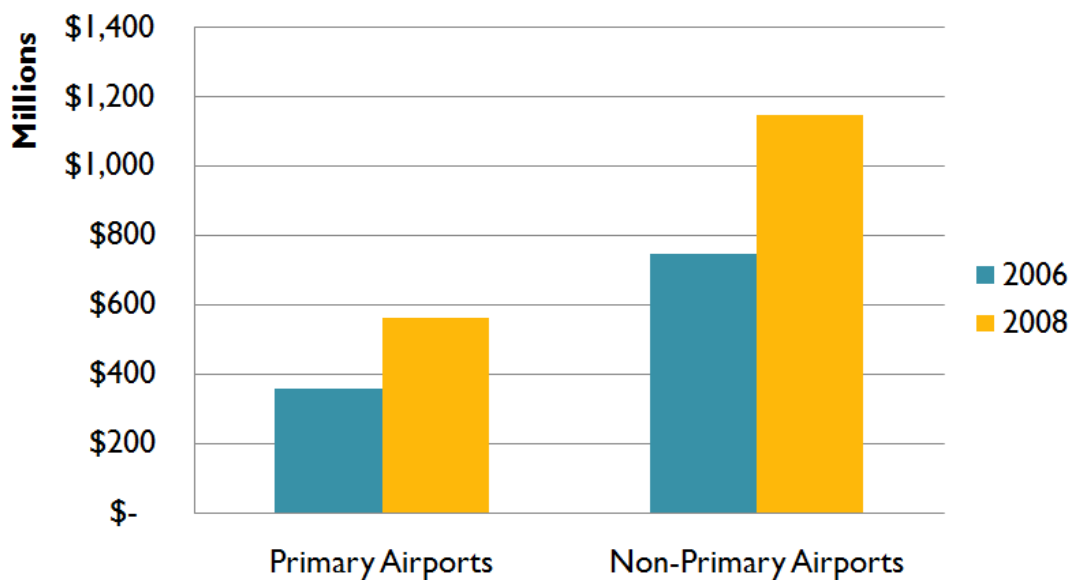
System Development Needs

Dye Management Group, Inc. reviewed the Airport Improvement Program (AIP), regional and MPO plan updates, and other needs reported in 2006 (seasonal closure and medi-vac needs that compose of extending runways to 3,300 ft. and adding 24-hour lighting). The project team also adjusted the 2006 needs to account for inflation. Besides an updated AIP, the following two plans have been updated since our previous analysis:

- Ted Stevens AIA master plan completed January 2009: <http://dot.alaska.gov/anc/about/masterPlan.shtml>
- Alaska Aviation System Plan Phase 1 Stage 1 completed January 2009: <http://www.alaskaasp.com/Documents.aspx>

The updates indicate that the 2009 needs have increased as compared to 2006 due to an increase in AIP needs and inflation-related adjustments. The updated AIP includes seasonal closure and medi-vac needs. The needs for primary airports have increased from about \$356 million to about \$562 million, while the non-primary airport needs have increased to about \$1.1 billion from \$746 million.

Exhibit 11: Airport Improvement Program Needs



Airport Life Cycle Management Needs

Dye Management Group, Inc. updated the paved airport life cycle management model using updated condition data received from ADOT&PF. Updated data indicates that the overall condition of airports improved over the last three years. The following Exhibit 12 shows the percentage of system below the PCI standards for ADOT&PF, broken down by three primary system components and by region.²

Exhibit 12: Percentage of System below Pavement Condition Standard (PCI)

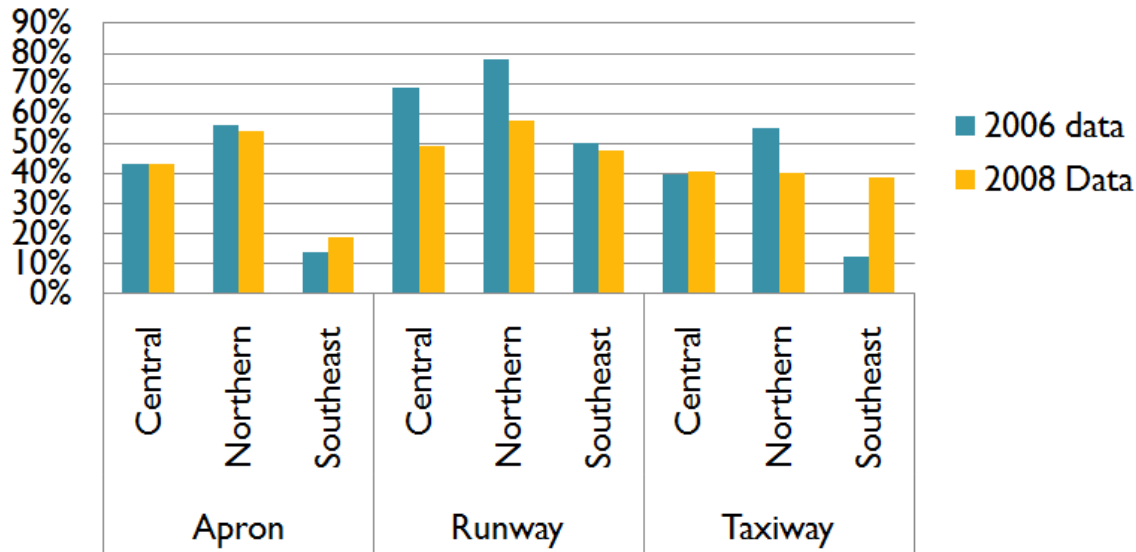
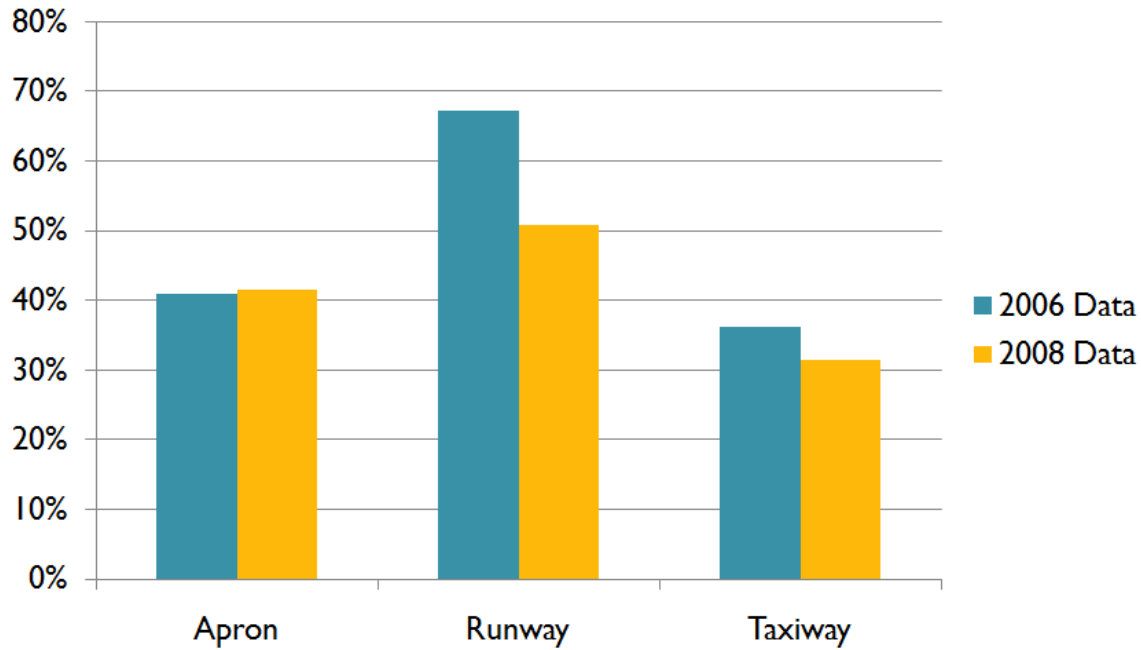


Exhibit 13 below shows the percentage of system below the PCI standards for ADOT&PF, broken down by three primary system components.

² The guidelines for PCI goals as set by Alaska legislature are seventy for runways and sixty for taxiways and aprons.

Exhibit 13: Percentage of System below Pavement Condition Standard (PCI) - Statewide



A life cycle needs analysis indicates that the runway needs increased to about \$557 million from about \$553 million, while the taxiway & apron needs decreased to about \$536 million from about \$577 million. The overall needs reduced to about \$1.09 billion from 2006 needs of about \$1.13 billion.

Exhibit 14: Paved Airports Total Life Cycle Needs Comparison

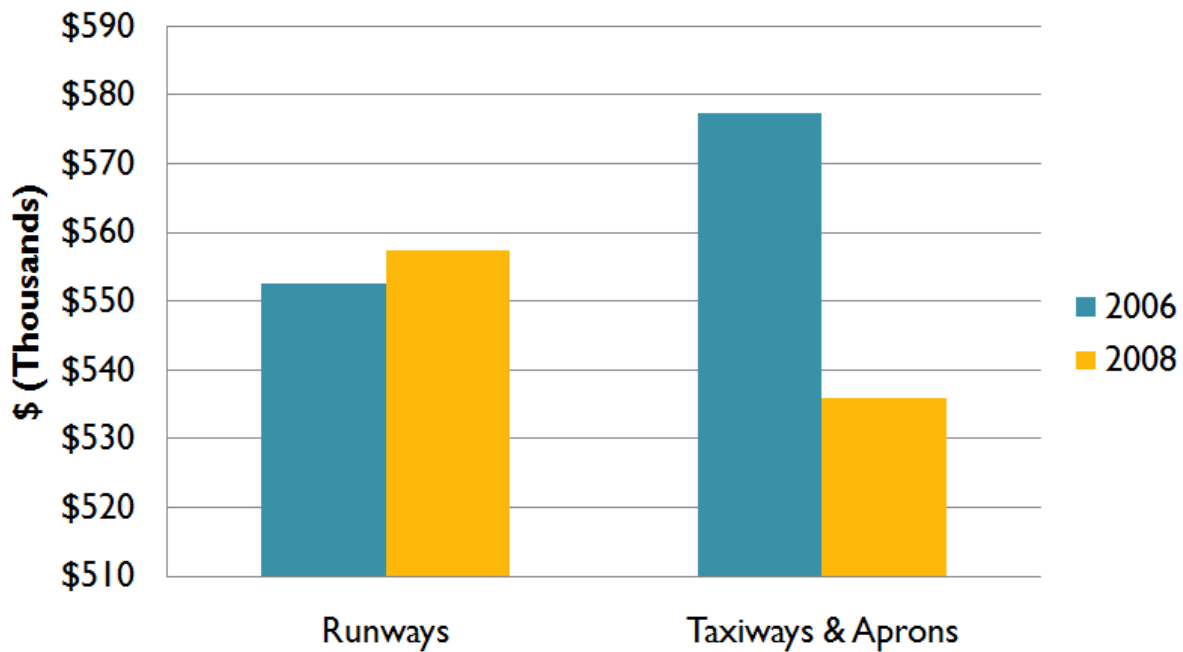


Exhibit 15 below presents a comparison of current needs (based on 2008 condition data) and needs shown in *Let's Get Moving 2030* (based on 2006 condition data), broken down by aviation components and regions.

Exhibit 15: Paved Airports Total Life Cycle Needs Comparison

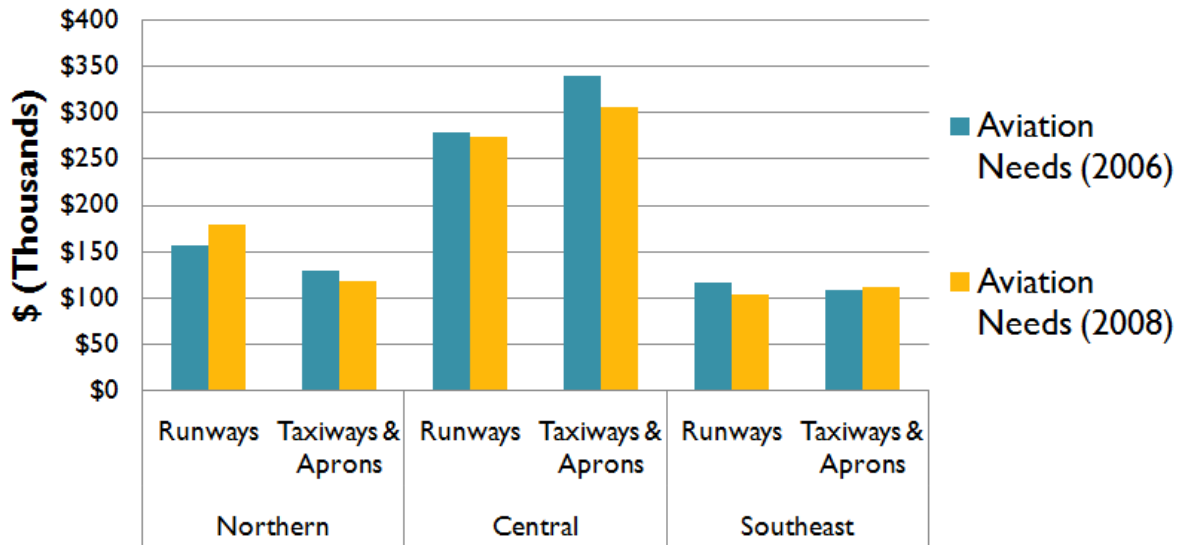
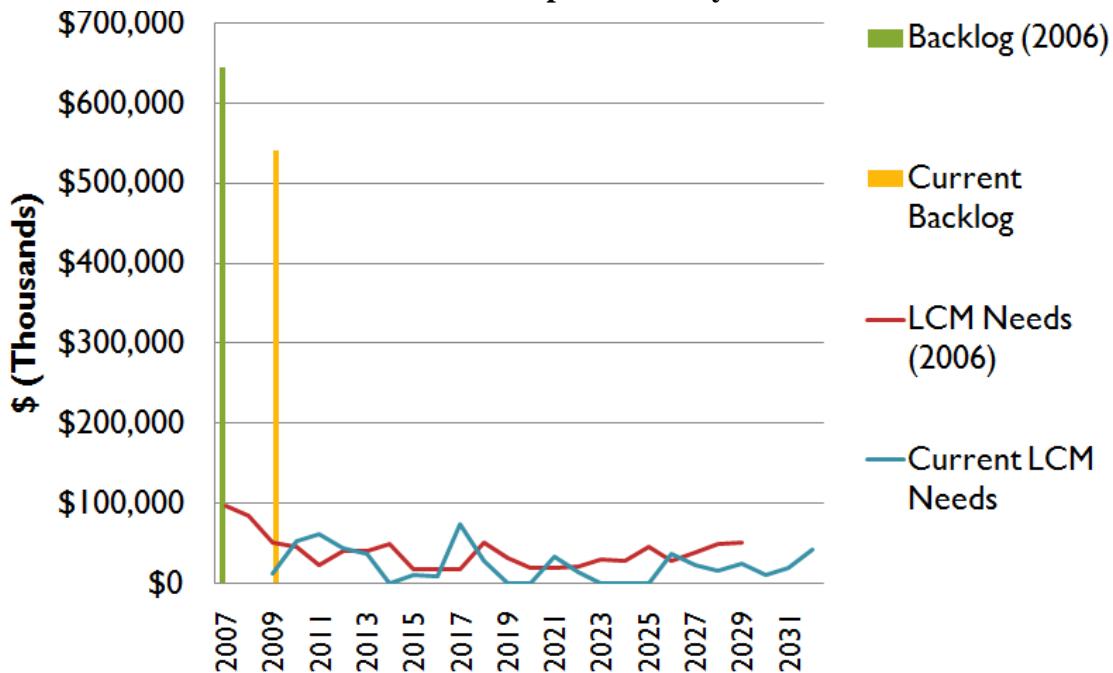


Exhibit 16 below indicates the life cycle management needs by year. As shown below, the backlog of needs decreased along with an overall reduction in needs.

Exhibit 16: Paved Airports Life Cycle Needs



6. Alaska Marine Highway System (AMHS) Needs Update

In order to update AMHS needs, Dye Management Group, Inc. reviewed the following components:

- AMHS fleet condition report to obtain updated condition data
- Vessel replacement needs through feedback from key AMHS staff members
- Changes to vessel refurbishment and recertification costs per year, if any, as obtained through feedback from key AMHS staff members
- Terminal additions/replacements as obtained from updated STIP
- Inflation adjustments to regional and MPO plans
- Operations and maintenance expenditures, as calculated using average of the last three years' expenditures

The project team's analysis determined that no new fleet condition report(s) were available. Furthermore, ADOT&PF feedback indicates that vessel replacement and refurbishment/recertification costs used in prior analysis are still accurate.

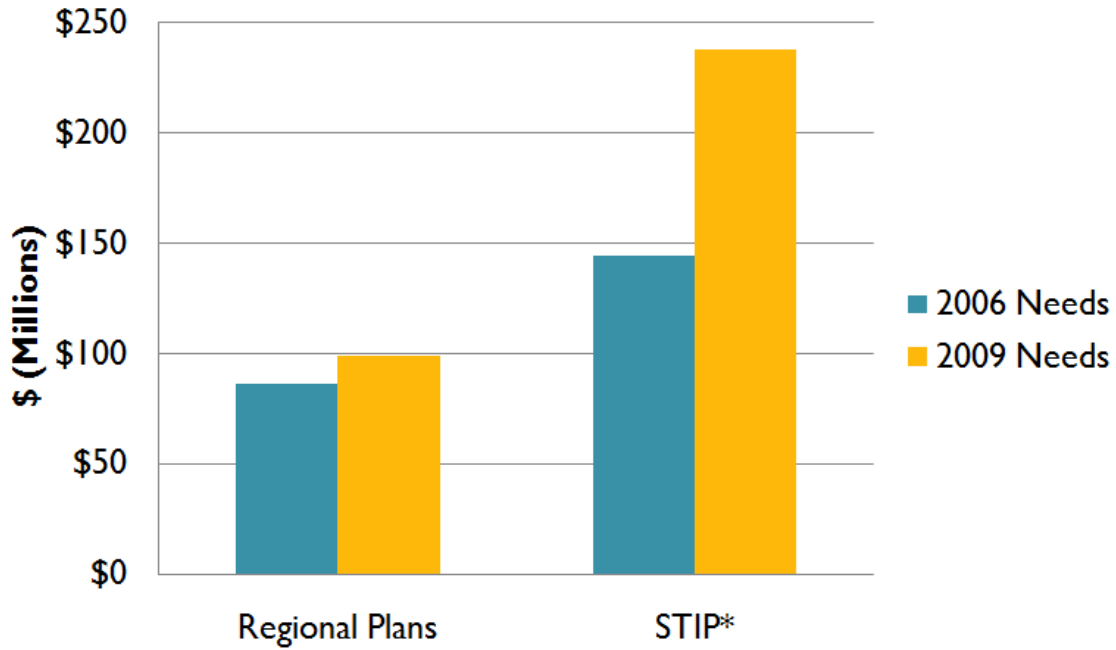
While not important for this needs update effort, two updates related to AMHS deserve being mentioned here:

- Statewide needs for ports and harbors are being collected, analyzed and prioritized as part of the *Alaska Regional Ports Phase 1 Study*. This work is estimated to be completed in June 2011
- The *Shore Facilities Condition Report* was completed in 2009³

STIP analysis indicates that the needs have increased to about \$237.7 million from about \$144.2 million. STIP and regional plan update is presented in Exhibit 17. The STIP needs presented below include vessel refurbishments.

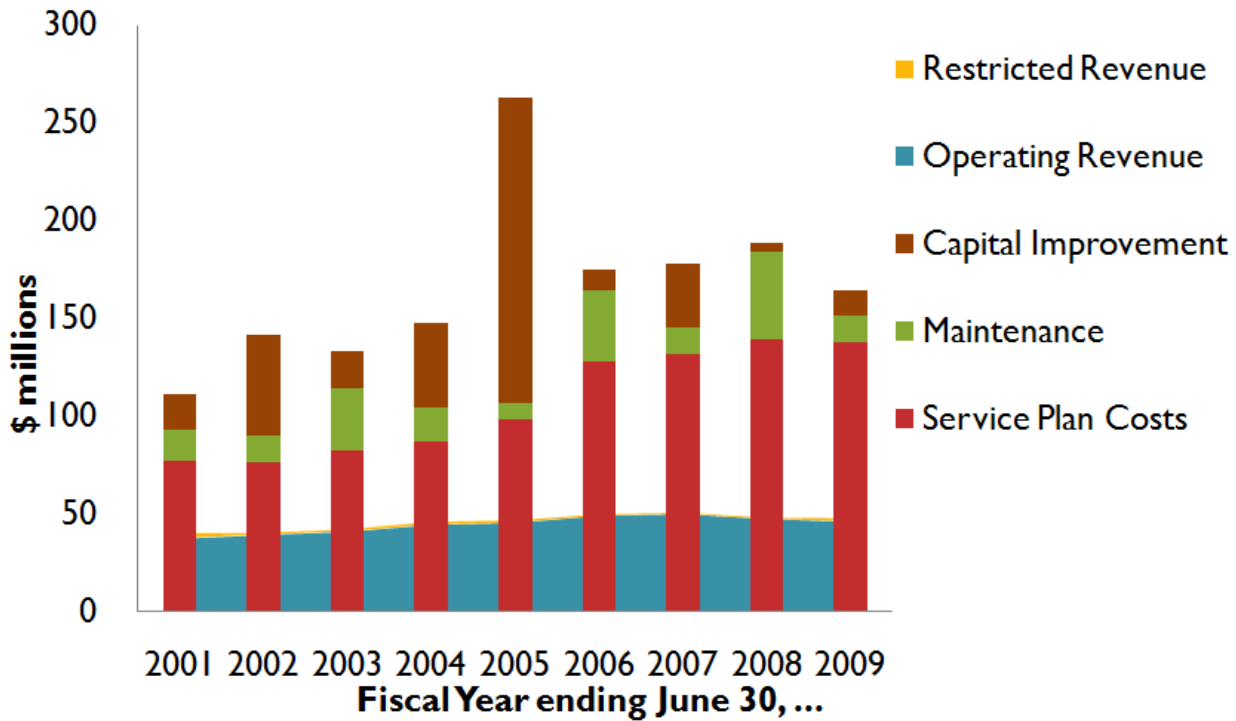
³ http://www.dot.state.ak.us/stwdplng/projectinfo/statewide/assets/2009_Shore_Condition_Report.pdf

Exhibit 17: AMHS System Development Needs



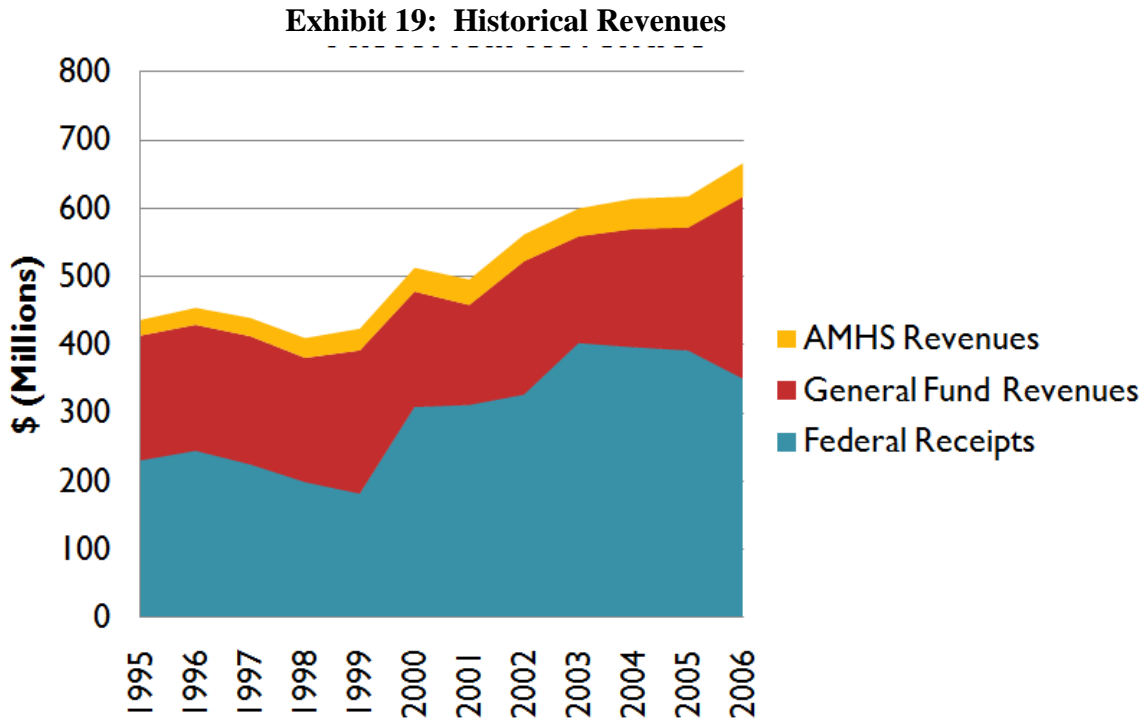
A review of AMHS financials indicates no noteworthy changes in trends. The average of last three year's operations and maintenance expenditures (assumed to be future needs) increased from about \$120 million to about \$140 million.

Exhibit 18: AMHS Financial Trends



7. Revenue Update

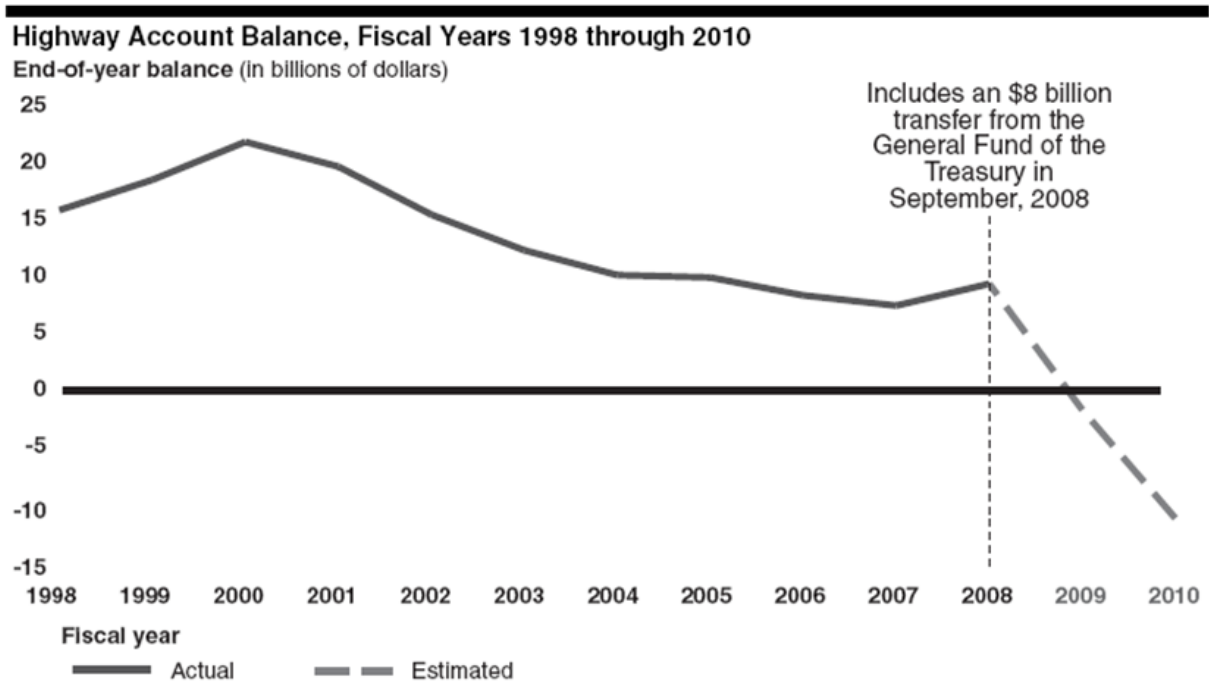
Dye Management Group, Inc. reviewed data updates available from FHWA to update ADOT&PF's revenues, and determined that while 2006 data was available, federal receipts and disbursement data for 2007, 2008 and 2009 were not available. A review of 2006 data indicates an 8% increase in revenues over 2005. There was a decrease in Federal receipts, but an increase in General fund and AMHS revenues, leading to an overall increase in the revenues.



8. Highway Trust Fund Forecast Update

A forecast of highway trust fund prepared by the U.S. Government Accountability Office (U.S. GAO) in June 2009 is presented below in Exhibit 20. As indicated in the exhibit, the actual end of year balance decreased over the years. Furthermore, GAO estimates that the end of year balance will be negative starting in Fiscal Year 2009.

Exhibit 20: Highway Trust Fund Forecast

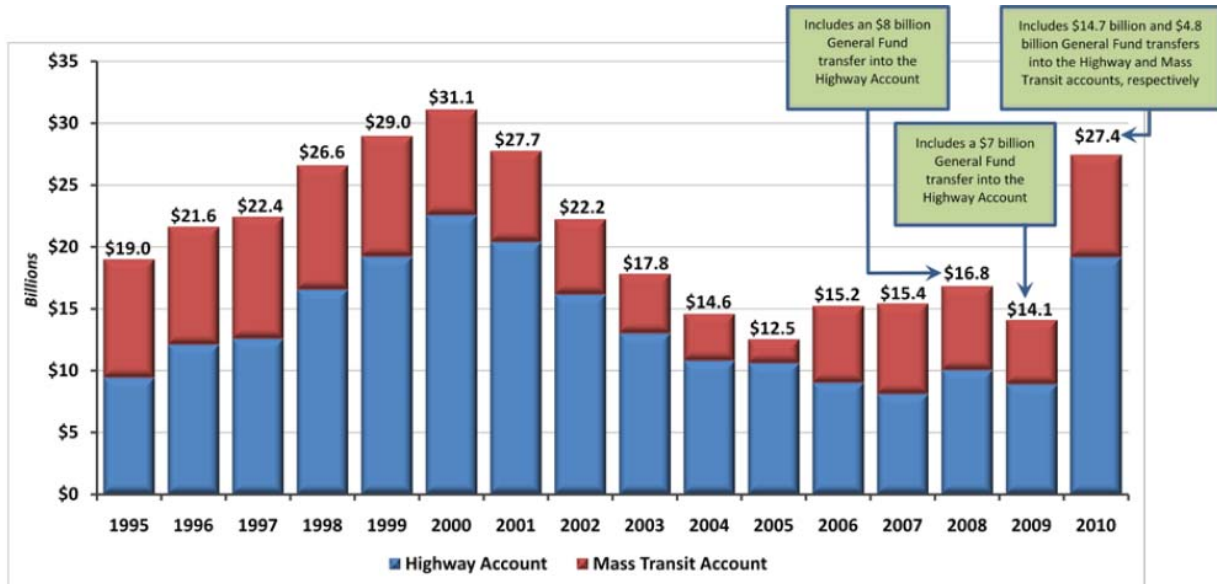


An update in June 2010 does not provide an updated forecast, but indicates that “Since 2005, every state received as much or more funding for highway programs than they contributed to the Highway Account of the trust fund. This was possible because more funding was authorized and apportioned than was collected from the states and the fund needed to be augmented with general revenues.”

The actual highway account balance updated in November 2010 by USDOT⁴ and presented in Exhibit 21 indicates a positive cash balance in FY 2010, primarily due to General Fund transfers into Highway Account (in FY 2008, 2009 and 2010), and Mass Transit Account (in FY 2010). The report confirms that “without cash infusions from the General Fund, the Federal Highway Administration would have been forced to reduce or suspend disbursements to states for eligible surface transportation expenses.”

⁴ <http://www.oig.dot.gov/sites/dot/files/TMC%20for%20FY%202011%20-%20508.pdf>

Exhibit 21: Historical Cash Balances in Highway and Mass Transit Accounts, Fiscal Years 1995 through 2010, in Billions of Dollars (November 2010)



Source: Federal Highway Administration, Federal Transit Administration

Note: In 1999, \$8 billion was transferred from the Highway Account to the General Fund. Fiscal year 2010 amounts are preliminary and subject to adjustment.

9. Consolidated Needs Update

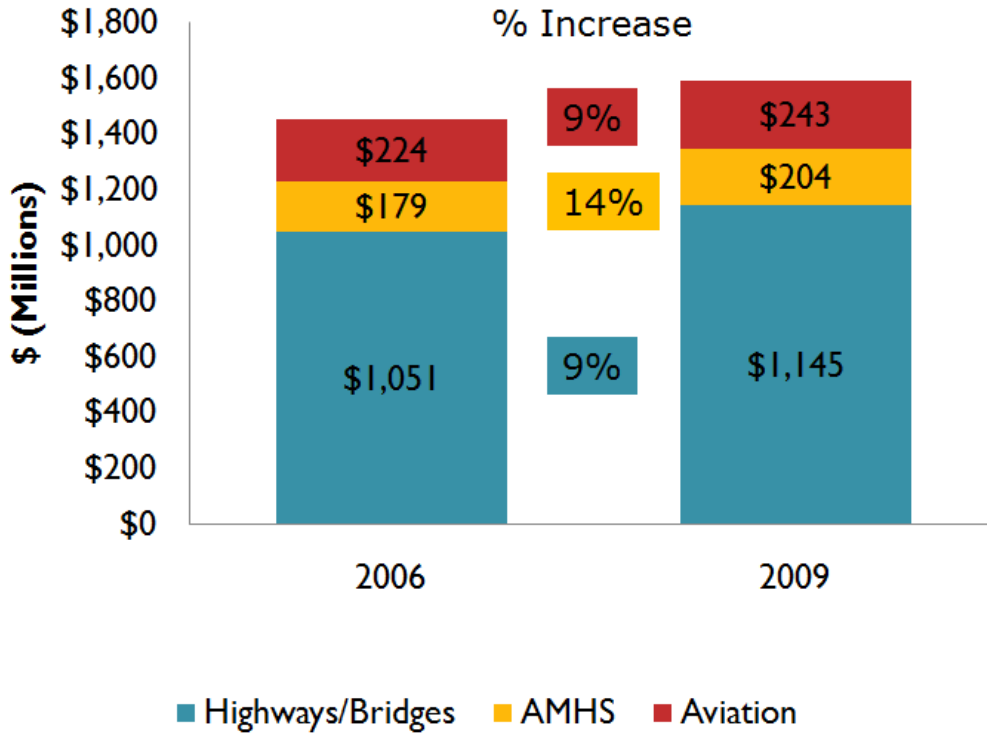
Exhibit 22 below shows the updated needs for ADOT&PF's transportation system, followed by a comparison of 2006 and 2009 needs.

Exhibit 22: Consolidated Needs

		Total Needs	Annual Needs 2009 \$ Millions	System Total (Annual) 2009 \$ Millions
Highways & Bridges	System Development	\$13,611,814,742	\$592	\$1,145
	Life Cycle Management-Highways	\$8,843,863,450	\$385	
	Life Cycle Management-Bridges	\$644,000,000	\$58	
	Routine Maintenance – Highways and Bridges	\$2,401,903,028	\$111	
AMHS	System Development (Fleet Additions)	\$0	\$0	\$204
	LCM (Fleet Replacement)	\$600,000,000	\$26	
	LCM (Fleet Refurbishment/Recertification)	\$529,000,000	\$23	
	System Development (Terminal Additions/Replacement*)	\$336,717,364	\$15	
	Operations & Maintenance	\$3,224,101,667	\$140	
Aviation	System Development	\$3,240,465,765	\$141	\$243
	Life Cycle Management	\$1,390,386,314	\$60	
	Routine Maintenance	\$905,081,399	\$42	

Exhibit 23 below presents a comparison of 2006 and 2009 needs in a graphical format. As shown below, the overall needs have increased by about 9%, with the overall highway/bridge and aviation needs increasing by about 9% and the AMHS needs increasing by about 14%. Given an overall increase in construction costs, the increase in needs was more or less expected.

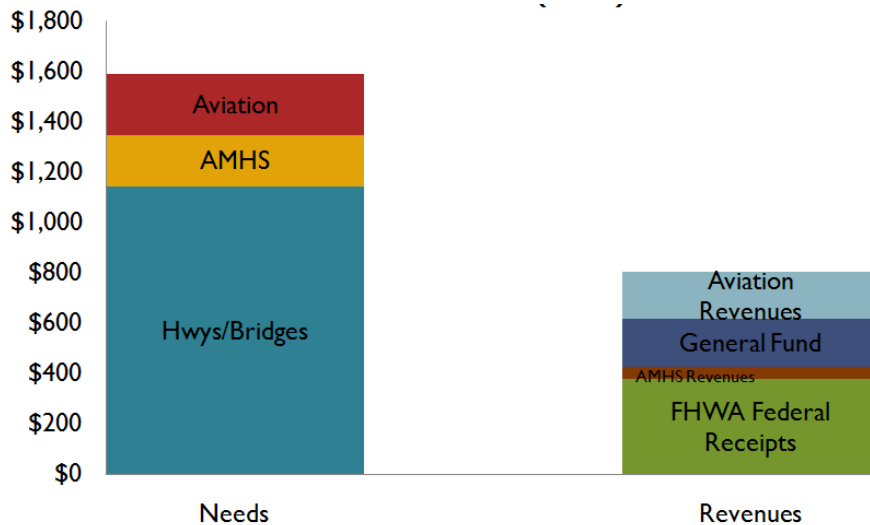
Exhibit 23: Comparison of 2006 & 2009



10. Needs vs. Revenues

Exhibit 24 presents updated needs versus revenues in a graphical format. Comparing 2006 data to 2009 data indicates that both needs as well as revenues increased, but the gap between the two has increased.

Exhibit 24: Needs vs. Revenues (2009)



C. Conclusion

The gap between needs and revenues has increased since the last analysis. Most of the changes, especially the deterioration in asset conditions were anticipated given the initially available funding levels. None of the changes portray significant changes to prior trends. As a result, the strategies and actions presented in Let's Get Moving 2030 are still valid and ADOT&PF should continue progressing on them as planned.