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Aircraft Emission Impacts in a Neighborhood Adjacent to a General Aviation Airport in Southern California

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Real time air pollutant concentrations were measured downwind of Santa Monica Airport (SMA), using an electric vehicle mobile platform equipped with fast response instruments in spring and summer of 2008. SMA is a general aviation airport operated for private aircraft and corporate jets in Los Angeles County, California. An impact area of elevated ultrafine particle (UFP) concentrations was observed extending beyond 660 m downwind and 250 m perpendicular to the wind on the downwind side of SMA. Aircraft operations resulted in average UFP concentrations elevated by factors of 10 and 2.5 at 100 and 660 m downwind, respectively, over background levels. The long downwind impact distance (i.e., compared to nearby freeways at the same time of day) is likely primarily due to the large volumes of aircraft emissions containing higher initial concentrations of UFP than on-road vehicles. Aircraft did not appreciably elevate average levels of black carbon (BC), particle-bound polycyclic aromatic hydrocarbons (PB-PAH), although spikes in concentration of these pollutants were observed associated with jet takeoffs. Jet departures resulted in peak 60-s average concentrations of up to 2.2×10^6 cm^{-3}, 440 ng m^{-3}, and 30 μg m^{-3} for UFP, PB-PAH, and BC, respectively, 100 m downwind of the takeoff area. These peak levels were elevated by factors of 440, 90, and 100 compared to background concentrations. Peak UFP concentrations were reasonably correlated ($r^2 = 0.62$) with fuel consumption rates associated with aircraft departures, estimated from aircraft weights and acceleration rates. UFP concentrations remained elevated for extended periods associated particularly with jet departures, but also with jet taxi and idle, and operations of propeller aircraft. UFP measured downwind of SMA had a median mode of about 11 nm (electric mobility diameter), which was about half of the 22 nm median mode associated with UFP from heavy duty diesel trucks. The observation of highly elevated ultrafine particle concentrations in a large residential area downwind of this local airport has potential health implications for persons living near general aviation airports.

1. Introduction

A handful of studies have shown that air quality in the vicinity of major airports can be seriously impacted by emissions from activities of aircraft and ground support vehicles. Concentrations of ultrafine particle (UFP), particle-bound polycyclic aromatic hydrocarbon (PB-PAH), black carbon (BC), and NO_x were measured in the vicinity of Los Angeles International Airport (LAX) and markedly high UFP concentrations of about 5.0×10^5 cm^{-3} were observed 500 m downwind of the takeoff runways (*1*). The observed downwind UFP number concentrations were dominated by freshly generated particles with peak modes of 10–15 nm, whereas upwind UFPs were dominated by aged particles with a mode of about 90 nm. A study of London Heathrow Airport (*2*), reported aircraft NO_x at least 2.6 km from the airport. Approximately 27% of the annual mean NO_x was due to airport operations at the downwind airfield boundary, declining below 15% at 2–3 km. VOC, NO_x, CO, and CO_2 were measured around the Zurich Airport (*3*). The observed CO concentrations were highly dependent on aircraft movement, whereas NO emissions were dominated by ground support vehicles (*3*). In a study of airborne PB-PAH and vapor-phase PAH concentrations during activities of C-130H aircraft, average PB-PAH concentrations of 570 ng m^{-3} were observed 20–30 m at low and high idle, as compared to about 14 ng m^{-3} background concentrations (*4*).

Studies around general aviation airports are more limited. Recently, the South Coast Air Quality Management District made measurements of $PM_{2.5}$, total suspended particles (TSP), lead, and ultrafine particle concentrations in the areas around Santa Monica Airport (SMA), the subject of the present study, and nearby Van Nuys Airport (*5*). They found no discernible elevation of 24 h averaged $PM_{2.5}$ mass, and highly elevated total suspended particulate lead, by up to a factor of 25 (to 96 ng m^{-3}) immediately adjacent to the takeoff area and a factor of 7 higher than background (to 28 ng m^{-3}) in the residential area. They also observed spikes in ultrafine particle number concentrations associated with aircraft departures.

Typically a buffer area isolates commercial airports from residential neighborhoods to reduce noise and pollution impacts. Small airports in heavily populated areas do not necessarily have these buffers, however, so residents may be more directly exposed to aircraft emissions. In the current study, air pollutant concentrations were measured using a mobile platform (*6, 7*) during spring and summer seasons of 2008 downwind of SMA located in Santa Monica, California. SMA is a small airport operated for private aircraft and corporate jets, occupying a 1600 m by 750 m area, as shown in Figure 1. SMA is closely bounded by dense residential neighborhoods with narrow buffer areas, particularly at the ends of the runways (Figure 1). We observed markedly high concentrations of air pollutants in the residential neighborhoods downwind of SMA due to aircraft activities, particularly takeoffs, suggesting current land-use practices of reduced buffer areas around local airports may be insufficient.

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FIGURE 1. Santa Monica Airport, nearby neighborhood residential area, and measurement sites east of SMA. The distances were measured from Google Maps.

TABLE 1. Monitoring Instruments on the Mobile Platform

instrument	measurement parameter	time resolution
TSI portable CPC, model 3007[a]	UFP count (10 nm-1um)	10 s
TSI FMPS, model 3091	UFP size (5.6–560 nm)	10 s
TSI DustTrak, model 8520[b]	$PM_{2.5}$ Mass[a]	5 s
Magee scientific aethalometer	black carbon	1 min
EcoChem PAS 2000	particle bound PAH	5 s
Teledyne API model 300E[c]	CO	20 s
LI-COR, model LI-820[c]	CO_2	10 s
Teledyne-API model 200E[c]	NO_x, NO, NO_2	20 s
Visalia sonic anemometer and temperature/RH sensor	local wind speed and direction, temperature, relative humidity (RH)	1 s
Stalker LIDAR and Vision digital system	traffic documentation, distance and relative speed	1 s

[a] The data obtained by the CPC were used only as a reference for the UFP concentrations measured by FMPS. [b] Because of concerns about the quality of this instrument's data, it is not reported here. Qualitatively, its results were consistent with the other mass-based measurements. [c] These instruments were turned off to save power for most measurement times (see text).

2. Materials and Methods

2.1. Mobile Platform and Data Collection. A Toyota RAV4 sub-SUV electric vehicle served as the mobile platform, eliminating any potential self-pollution. Table 1 shows the sampling instruments and equipment installed on the mobile platform. Ultrafine particles were measured by a fast mobility particle sizer (FMPS) spectrometer in size range of 5.6–560 nm, which includes the UFP size range of less than 100 nm. Most instruments had a time resolution of 1–20 s except the Aethalometer, which had one minute time resolution. Calibration checks and flow checks were conducted on a bimonthly and daily basis, respectively (*6*, *7*).

2.2. Measurement Sites. SMA experiences consistent wind patterns; the vast majority of days have a sea breeze (winds from the west to south-southwest) for most of the day and a land breeze at night. The runways of the airport are aligned at about 225° so that aircraft can take off into the wind. For all of our measurements, the take off direction was to the west (as is the case for at least 95% of days at SMA), with taxi and idle at the east end of the runway (Figure 1E). As the airport allows operations of nonemergency aircraft only from 07:00–23:00 on weekdays and 08:00–23:00 on weekends due to noise ordinances, only daytime hours were considered.

In the current study, the measurements were conducted primarily at four stationary sites (A–D indicating increasing distances from the airport) in the residential area downwind of the takeoff area (E) as shown in Figure 1.

Figure 1 includes a line indicating the expected centerline along which emissions plumes travel during typical on-shore flow conditions, as if it is an extension of the runways in the airport. Sites B and D were selected for measurement because they are approximately on this line. Sites A and C were chosen to test the extent of horizontal impacts and are at perpendicular distances 50 and 250 m, respectively, from the extended centerline of the runways.

In spring and summer of 2008, four days of measurements were conducted: April 14 and 20, July 20 and August 8, for 4–6 $^1/_2$ hours each day. The four stationary measurement sites in the residential neighborhoods downwind of the airport were sampled in random order to minimize systematic errors. In addition, the mobile platform was stopped briefly in the mornings and afternoons of three days (July 8, 10, and 12) in the summer season at Clarkson Rd, site B, and Barrington Ave, site D, to confirm the observations of elevated pollutant concentrations on the dedicated measurement days. The measurement times are listed in Table 2.

2.3. Data Analysis and Selection of Key Pollutants. Data were adjusted for the varying response times of the instruments on the mobile platform to synchronize the measurements (*6*, *7*). UFP, PB-PAH, and BC were selected in the current study for detailed spatial analysis because of their large concentration variations in the vicinity of SMA, and important implications for human exposure assessment. CO_2 concentrations were used in emission factor calculations (see Section 3.3.3).

3. Results and Discussion

3.1. Meteorological Data and Background Concentrations. Meteorological conditions, including temperature, relative humidity, wind speeds, and wind directions (all measured while the mobile platform was stopped), can all play a role in determining air pollutant concentrations surrounding SMA. The average wind speeds and directions are shown in Table 2 for the measurement times. The wind was stable and predominantly from the SW (204–261°) in the afternoons, with speeds of 1.9–3.0 m s^{-1}. In the mornings, the wind had lower speeds of 1.0–1.7 m s^{-1}, and variable directions in a range of 117–349°. This implies the east end of the airport was always downwind in the afternoons, but not always in the mornings, and pollutant dispersion rates were higher in the afternoons.

Average background UFP concentrations were 1.7×10^4 and 5×10^3 cm^{-3} in spring and summer of 2008, respectively. Background UFP, PB-PAH, and BC concentrations, measured on Stoner Ave 830 m NNE of the takeoff area (E), on the four dedicated days, averaged $1 \pm 0.3 \times 10^4$ cm^{-3}, 5 ± 2 ng m^{-3}, and 0.3 ± 0.1 $\mu g\, m^{-3}$, respectively, for the spring and summer measurement periods combined (PAH data was available for only two of the summer days). Measurements were made immediately preceding and/or following stops at the monitoring sites, on 12 occasions for 3–5 min each. The UFP concentrations at this site were relatively stable, consistent with an absence of aircraft or other strong UFP sources, even when there had been jet activity at SMA within the 7–8 min preceding the measurements (which happened on five

TABLE 2. Air Traffic and Meteorological Conditions during Measurements

date	time	arrivals (jets)[a]	departures (jets)[a,b]	wind speed[c] (m s^{-1})	wind direction[c]	temperature (°C)
4–14–2008	09:00–11:00	21(7)	/(3)	1.7	230	23.0
	15:30–18:00	15(8)	/(8)	2.4	235	
4–20–2008	14:00–18:00	34(13)	18(14)	2.5	261	22.0
7–08–2008	08:22–08:25	na[d]	na[d]	1.0	117	20.1
	13:20–13:46			2.2	213	21.3
7–10–2008	08:27–08:34	na[d]	na[d]	1.1	349	20.5
	13:22–13:35			1.9	204	23.8
7–12–2008	08:44–08:58	na[d]	na[d]	1.4	200	21.5
	13:24–13:34			2.1	226	24.7
7–20–2008	11:50–18:00	42(17)	20(14)	1.9	227	22.2
8–08–2008	15:30–22:00	24(9)	13(8)	3.0	237	22.2

[a] Total reported activities during the measurement time period. [b] The airport records all arrivals but only departures that exceed a specific noise threshold, thus departures exceed the values reported here. All jet departures are reported, but many small propeller plane departures are not. [c] Averaged values for the measurement periods. [d] Air traffic data are not available for these measurement periods (na).

occasions). These background values were typical of other streets around SMA away from the influence of the airport, throughout the spring and summer seasons (see also ref *6*). Sampling at sites A, B, and C, were about equally weighted between spring and summer, thus for these sites we use this combined average. Most of the sampling at site D, however, was performed during summer, so for this site we weighted the background UFP concentrations to match the distribution of sampling, and thus use 6000 cm^{-3} as the site D average background.

3.2. Air Traffic Volumes and Aircraft Operation. Air traffic logs were provided by SMA. The numbers of arriving aircraft are listed in Table 2 for the measurement periods on dedicated days. Departures are also indicated; however, the airport only recorded activity exceeding a sound threshold of 80 db at the west end of the runway, in compliance with a local ordinance, thus small propeller plane departures were not included in the log. Based on statistics of four dedicated measurement days, the number of aircraft arrivals was about 80/day, of which about 30 were various small (6–8 passengers) to large jets (20–35 passengers), and the remainder were single and twin engine piston and turboprop planes. The diurnal hourly arrival/departure aircraft activities at SMA for the four dedicated measurement days show the great majority of aircraft operations at SMA took place during 09:00–20:00 and averaged about six arrivals per hour during these hours.

Jets and propeller planes taxi 800–1000 m to the take off area E. The taxi time for aircraft is about 2 min, much longer than the acceleration time on the runway during take off, typically 20–25 s. Also, because the jet flight path from SMA intersects that of Los Angeles International Airport (LAX) about 16 km after take off, jets taking off from SMA must wait for permission from LAX, resulting in an average waiting time of about 5 min. This implies an average taxi-waiting time of about 7 min for jets departing from SMA.

3.3. Impact of SMA on Downwind Residential Area. Markedly elevated concentration peaks of ultrafine particle, PB-PAH, and BC were observed downwind of SMA, extending to at least 660 m along the wind direction (site D), and 250 m perpendicular to the prevailing wind directions (site C, about 300 m downwind). At all sampling locations, when an airplane (particularly a jet) was preparing to depart, typically a loud noise was heard first (start of taxi). If the wind was from the south-southwest to west, the noise was followed by fuel vapor odors, and then a few minutes later by elevated concentrations of ultrafine particles, black carbon, and PB-PAH. This suggests taxiing frequently produces fuel odors, while hard accelerations are usually necessary to produce large pulses of UFP, PB-PAH, or BC.

3.3.1. Average UFP Concentrations Measured Downwind of SMA. Figure 2 shows UFP concentrations at the four sites during the combined spring and summer measurement periods (Table 2). The data are for various durations at the sites, and thus the quantity of data from each site is different. The numbers of observations for sites A, B, C, and D were 730, 5100, 470, and 1700 in 5-s averages, respectively. The average UFP concentrations at sites A, B, C, and D were 106, 97, 47, and 15 K cm^{-3}, respectively, about 11, 10, 5, and 2.5 times the corresponding area background levels for all measurement days combined. Figure 2 also shows the average BC concentrations were 2.7, 1.3, 0.8, and 0.8 $\mu g/m^3$ at the sites A, B, C, and D, respectively, elevated from the area background level of 0.3 $\mu g/m^3$. PAH data are not shown because these data are not available for all days. Both UFP and BC are elevated at all four sites, consistent with airport impacts. However, they are not elevated by exactly the same ratio at each site, for reasons we are unable to explain with current data.

Site A is located in a gas station downwind of the intersection of National Blvd. and Bundy Dr. The mobile platform was stopped at the SW, upwind, corner of the gas station, and thus measurements were not likely strongly influenced by activities in the gas station. The likely small contribution of vehicles accelerating from the intersection to the observed UFP concentrations is discussed in Section 3.3.4.

3.3.2. Size Distribution and Mass of UFP Downwind of SMA. Sixty jet emission size distributions at SMA were analyzed. Aircraft emissions produced UFP with a median size mode of about 11 nm with little variability, consistent with the observations at LAX (*1*). Figure 3 shows a representative size distribution of ultrafine particles from a jet takeoff. This peak had a UFP concentration of 1.0×10^6 cm^{-3}. Figure 3 also shows a representative size distribution of UFP from an isolated heavy duty diesel truck (HDDT) measured by our MP on a surface street in the downtown area of Los Angeles. The peak UFP concentration was also about 1.0×10^6 cm^{-3}, but the mode, about 22 nm, is significantly larger than the modes of the UFP distributions observed from

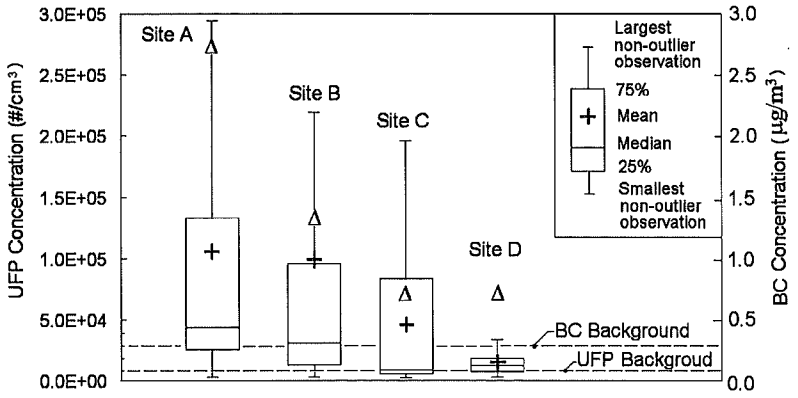

FIGURE 2. UFP concentrations at the four measurement sites during all measurement periods (Table 2). The symbol "Δ" indicates the mean value of BC concentrations for all measurement times. It is noted that because much less sampling was performed at Sites A and C, these data may carry higher uncertainties.

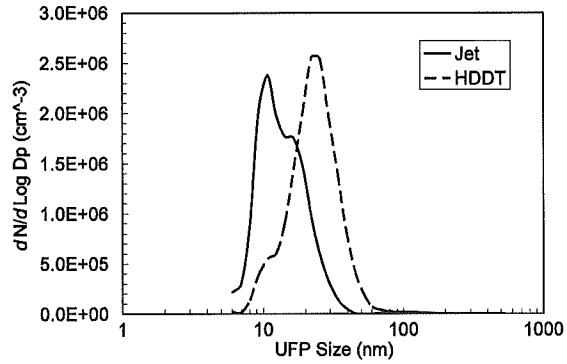

FIGURE 3. Comparison of size distribution of UFP downwind of SMA and from a heavy duty diesel truck (HDDT).

aircraft. The peak UFP concentrations from the aircraft and HDDT were about 100 and 25 times the background levels (which were not subtracted), respectively. Size distributions were collected after the emissions plumes had been diluted sufficiently that they would not be undergoing significant self-coagulation, which has been calculated to be any time after the first 1−3 s following exhaust released from the tail pipe (*8*).

Aircraft activity clearly results in markedly elevated UFP number concentrations, but because UFPs are so small, they make only modest contributions to mass concentrations. For example, the average number concentration at Clarkson site B (100 m downwind) was about 9.7×10^4 cm^{-3} during the measurement periods, 10× the area background level. The calculated mass contribution of UFP caused by aircraft averaged 0.6 μg m^{-3}, assuming a particle density of 1.2 g cm^{-3} (*1*), only about 3% of the annual basin background level of ~18 μg m^{-3} of $PM_{2.5}$. If 24-h measurements were conducted to obtain average particle mass concentrations, the contribution of aircraft-related UFP during the aircraft operation period, typically 07:00−23:00, would be even smaller, consistent with the SCAQMD measurements (*5*). It should be noted, however, that potential health effects of UFP generally focus on the size and number of such particles and not their mass (e.g., ref *8*,).

3.3.3. Relationship between Downwind Pollutant Concentrations and Aircraft Events. Figure 4 shows typical time series of air pollutants measured at site B downwind of idle/take off area E (Figure 1) at SMA on the afternoon of July 20, 2008. On others days of measurements, similar elevated air pollutant concentrations, at least 10 times the seasonal background level, were repeatedly observed at the four sites. Note that the time of aircraft departures from the SMA log and peak UFP concentrations are very close, but do not always correspond perfectly. This may be due to occasionally high aircraft emissions during taxi as well as deviations resulting from the resolution of the airport log data (1 min), and variable travel time of the plume from the takeoff location and runway to our monitors.

Extremely high pollutant concentrations were observed at Site B, Clarkson Rd, 100 m downwind of SMA, specifically associated with jet operations at the airport. The Figure 4 time-series plot for site B shows UFP, PB-PAH, and BC as well as aircraft arrivals and some departures (upper abscissa) during the times of measurement. Here, multiple incidences of elevated air pollutant concentrations corresponded to jet departures, propeller aircraft departures, and possibly, aircraft arrivals. For example, at 12:20 (from the airport log) a Gulf Stream 4 jet (GLF4, 33 200 kg) departed, an event followed by measured concentrations of 60 s average PB-PAH and BC of 440 ng m^{-3} and 30 μg m^{-3}, respectively, resulting in elevated ratios of about 90 and 100 times the summer background levels, respectively. Both pollutants returned to background levels within about 3 min after the jet's departure. Additional spikes were observed associated with jet operations at 12:35, 12:36, 12:58, and 13:00 with 60 s average UFP concentrations up to about 2.2×10^6 cm^{-3}, about 440 times the summer background level. UFP concentrations remained elevated, hovering around 10^5 cm^{-3} for the remainder of the sampling period. The trace indicates that while arrivals of small aircraft, as well as taxi, idle, and takeoffs (although these do not appear in the log) release significant quantities of UFP, they do not appear to produce significant elevations of PB-PAH or BC.

As noted above, the average taxi and waiting of a jet before departure is about 7 min, but significantly longer taxi/waiting periods occurred from time to time. For example, during measurements at Site B, a loud noise was recorded from 12:07 until 12:20, during which time the particularly large jet (GLF4) was taxiing and waiting for take off. The peak at 12:12 and the following elevated UFP concentrations (Figure 4) were associated with this idling jet prior to its departure at 12:20. Figure 4 also shows a trace from later in the afternoon, a period with much lower aircraft activity and much lower UFP concentrations, which sometimes dropped to the summer background level of about 5000 cm^{-3} for several minutes at a time.

Significantly elevated pollutant concentrations were also observed at other three sites. For example, during one hour measurement on July 20, 2008 (13:04−14:03) at site D, just west of Barrington Ave, 660 m downwind of SMA, the UFP concentration was elevated above the summer background (5000 cm^{-3}) for most of the period, due to multiple aircraft operations (including taxi). The mean of the UFP concentration during this measurement period was 1.5×10^4 cm^{-3},

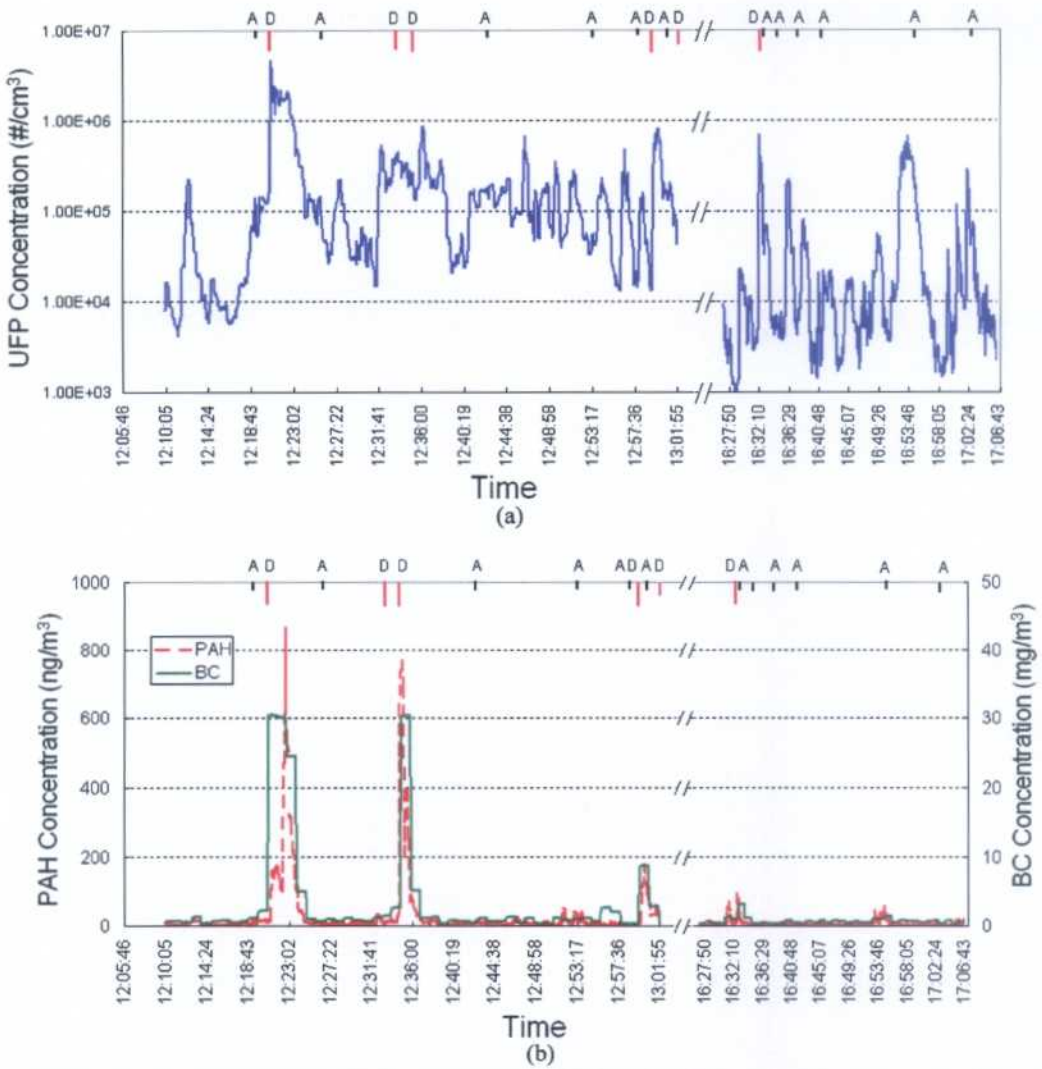

FIGURE 4. Time series plot of pollutant concentrations measured at Clarkson Rd, Site B, about 100 m downwind of the airport on July 20, 2008. (a) UFP. (b) PB-PAH and BC. On the upper abscissa, A/D denote for arrival/departure of aircraft. For departure, longer lines indicate jet activities and short lines are for activities of turboprop or piston aircraft.

about 3 times the summer background level. Spikes of PB-PAH and BC associated with aircraft activity were not observed at this site.

3.3.4. Potential Contribution from the Surface Street Immediately Downwind of the Airport. As noted earlier, a major surface street, Bundy Dr, ("Bundy", Figure 1), is located immediately east of SMA, between the usual aircraft take off area (E) and the measurement sites (A−D). To investigate the possible contribution of traffic on Bundy to elevated pollutant concentrations observed at site B, we reviewed traffic data on this street and also compared measurements made on nearby stretches of Bundy not influenced by the airport during the same sampling days as the aircraft measurements. The traffic flows on Bundy were recorded on digital video when the mobile platform was stopped at site B, and when traveling on nearby stretches of Bundy immediately preceding and following stops at the sampling sites around the SMA. The traffic counts on Bundy Dr. (and on National Blvd.) during our measurement times averaged 50−60 counts per minute, small compared to nearby freeways which have 200−300 vehicles min^{-1} during daytime. Traffic on this road is dominated by newer gasoline vehicles; further, only five heavy duty diesel trucks were encountered during 650 min of sampling on Bundy within 1.8 km of SMA.

Average on-road UFP concentrations on sections of Bundy removed from the airport impacts, but within 1800 m of SMA were much lower than observed at site B (25 m from Bundy), averaging 35 000 cm^{-3} during the sampling days listed in Table 2 (220 min of data). At site B in the absence of aircraft activity (Figure 4), the UFP concentrations were low, in the range 5000−15 000 cm^{-3}, indicating the contribution of traffic on Bundy to the average UFP measurement at site B, was less than 15 000 cm^{-3}. About one-third of the Site B UFP concentrations fell below 15 000 cm^{-3}, distributed reasonably evenly among the measurement periods. High-emitting vehicles (HEV) can cause large spikes of UFP concentrations, over 10^6 cm^{-3}, but these vehicles were rare (above). Vehicle-related UFP spikes are also brief, lasting less than 30 s for solo vehicles, and even shorter times in traffic. Hence, the contributions of high emission vehicles on Bundy to the average UFP concentrations measured at Site B were small, and HEV are unable to explain the frequent elevated UFP lasting 2 min or longer (e.g., Figure 4a) observed at the site B. This reinforces that the elevated pollutant concentrations we measured at site B were due to the emissions from aircraft at SMA. Similarly, we believe the elevated UFP concentration measured at site A in the gas

TABLE 3. Information about Aircraft Active at SMA

	code	type	passengers	weight (kg)	takeoff distance (m)	takeoff IAS (m s^{-1})[a]	associated peak UFP concentration (no. cm^{-3})
1	BE36	piston	6	1650	350	50	1.0×10^5
2	BE58	piston	4–5	2500	700	65	2.5×10^5
3	BE40	small jet	6–8	7300	1200	80	3.6×10^5
4	C152	piston	1	760	220	44	8.5×10^4
5	C441	turboprop	9	4470	550	65	1.2×10^5
6	C550	small jet	6	6850	1000	75	3.4×10^4
7	C560	small jet	8	7210	963	65	7.3×10^5
8	C750	large jet	12	16193	1740	80	1.8×10^6
9	F2TH	large jet	9–19	16240	1600	75	1.3×10^6
10	H25B	mid jet	8–14	12430	1700	75	6.6×10^5
11	LJ35	small jet	6–8	8300	1300	87	1.6×10^5
12	E135	large jet	35	19990	1400	82	
13	GLF4[b]	large jet	14–19	33200	1600	90	4.6×10^6

[a] Indicated aircraft speed; the speed as the aircraft leaves the ground. [b] Peak UFP concentration of GLF4 shown here was not included in the correlation because its fuel consumption rate estimated from eq 4 (see text) was an outlier from the cluster of values for other aircraft.

station was dominated by aircraft, not by vehicle emissions from the intersection of Bundy Dr. and National Blvd.

3.3.5. Comparison of Impact Areas from Santa Monica Airport and Freeways during Daytime. Measurements made in Southern California (*6, 9*) indicated UFP and other vehicle-related pollutant concentrations return to background by about 300 m downwind of major roadways during daytime, although the impact distance is much greater prior to sunrise (*6*). In the current study, average UFP concentrations 660 m downwind of SMA during the daytime were about 2.5× (all data) and 3× (summer only) the background, indicating a much greater impact distance for the airport than for roadways. Similar to our observation, elevated UFP concentrations were observed 900 m downwind of a runway at Los Angeles International airport (*1*). The phenomenon was attributed to landing aircraft passing within a few hundred meters overhead, combined with incomplete dilution of the high numbers of UFP emitted from aircraft during takeoff.

We believe the relatively long impact distance downwind of SMA, further than 660 m, is a result of the higher initial concentrations of UFP in aircraft emissions, combined with their larger volumes relative to vehicles. As far as we are aware, studies of particle emissions directly from aircraft are limited to large jets. We estimated UFP emissions per kg of fuel consumed from the jet aircraft operated at SMA for cases where we observed departures that produced clear isolated spikes in both CO_2 and UFP. Two suitable isolated peaks observed at the stop at site B on August 8 indicate the aircraft emissions contained roughly 5×10^{16} particles/kg of fuel consumed. The CO_2 difference was 12 ± 1.5 ppm, and the UFP difference was $(3.7 \pm 0.5) \times 10^5$ particles cm^{-3}. Large aircraft emissions have been reported to contain a range of $0.3–5 \times 10^{16}$ particles/kg of fuel consumed (*10, 11*). Our estimate for SMA is at the high end of this range. Also for commercial gas turbines, high particle numbers have been reported at lower thrust levels associated with lower fuel consumption rates (*10*), suggesting that even with much lower fuel consumption rates, aircraft taxi, and idle may be a significant source of UFP.

Our UFP emissions estimates for aircraft at SMA are 16–100 times higher than UFP emitted per kg of fuel consumed by light duty vehicles ($5 \times 10^{14}–3 \times 10^{15}$ particles/kg) (*12, 13*) and 5–8 times higher than heavy duty vehicles ($6 \times 10^{15}–1 \times 10^{16}$ particles/kg) (*12, 14*). Although the on-road vehicle values were measured under a range of typical on road conditions, and thus are not directly comparable to our aircraft measurements which are dominated by idle/low load and maximum load conditions, they are each real-world estimates relevant to exposure assessment.

Aircraft fuel consumption rates during takeoff are roughly 50–300 g s^{-1} for small piston or turboprop planes and can be up to about 500–5000 g s^{-1} for the types of jets that operate at SMA (*15*), much higher than rates for motor vehicles of 1–10 g s^{-1}. The fuel consumption rates for jets during takeoff tend to be high (up to several times those during cruise) because the jet engines are designed for high speeds and at high altitudes. This means aircraft emissions, especially during takeoff, have much higher volumetric flow rate than that of motor vehicles. This large volume of high concentration aircraft emissions is expected to take longer to be dissipated and diluted to the background level than vehicle emissions on roadways, consistent with our observations.

Zhang and Wexler proposed a model of aerosol dilution near roadways (*8*). They suggested a dilution ratio of about 1000:1 is complete in the first 1–3 s during the "tailpipe-to-road" stage, and an additional 10:1 dilution is completed in the following 3–10 min, the "road-to-ambient" stage. Dilution of aircraft emissions at the SMA are also complicated by the topography immediately east of SMA. The takeoff area is about 9 m higher than the measurement site B. Aircraft emissions need to first pass over a fence, about 3.5 m high, designed to mitigate noise and emissions impacts on neighborhoods, and then to pass over Bundy Dr to move into the downwind residential neighborhoods.

The travel times for pollutants to site B, and from the site B to D were 17–50 s and 1.5–6 min (corresponding to wind speeds of 2–6 m s^{-1}), in the range of the wind-shear-dominated second stage "road- to-ambient" dilution period (*8*). This implies a dilution ratio at site B vs site D of 10:1 or less. The average summer UFP concentrations at sites B and D were 8.9×10^4 and 1.5×10^4 cm^{-3}, respectively, indicating a dilution factor of about 8, for summer background concentrations of about 5000 cm^{-3}. This dilution factor is consistent with our estimates above, implying that the larger downwind impact area of the airport compared to that of roadways results from the large volumetric pulse of high concentration emissions produced by aircraft.

3.3.6. Correlation of Site B UFP Concentration and Estimated Aircraft Fuel Consumption Rates. To compare measured UFP concentrations with airport activities, we estimated aircraft fuel consumption rates at take off. Aircraft weight (m), passenger number, activity type (departure/arrival), take off length (L), and indicated aircraft speed (U, the aircraft velocity leaving the ground), determine the fuel consumption rate of ($\dot{m}_{fuel}$) during take off. Values for m, L, and U were obtained from aircraft specifications. Passengers, crew, and luggage usually add 6–15% of aircraft weight. If

a constant acceleration rate of aircraft on the runway is assumed,

$$L = at^2/2 \quad (1)$$

$$U = at \quad (2)$$

$$m_{fuel} \propto mU^2C_0C_1/2 \quad (3)$$

Here, a is the aircraft acceleration rate on the runway; t is the time of aircraft spent on the runway during acceleration; m_{fuel} is the total fuel mass consumed by aircraft during acceleration; C_0 is the overall conversion efficiency of energy from fuel to aircraft kinetic, and C_1 is a constant accounting for the weight of the passengers, crew, and luggage. Here, the same C_0 and C_1 are assumed for all aircraft. Combining eqs 1−3, we obtain a fuel consumption rate for aircraft during acceleration on the runway as:

$$\dot{m}_{fuel} \propto mU^3/L \quad (4)$$

For similar atmospheric conditions and assuming the same dilution ratio of emissions from all aircraft, the peak UFP concentrations measured at site B should be roughly proportional to the peak air pollutant concentrations emitted from an aircraft, which are proportional to the fuel consumption rate during take off. The jets at SMA are heavier (7000−33 000 kg), faster (indicated aircraft speed, or IAS, of 70−90 m s^{-1}), and have longer take off lengths (1000−1800 m) than propeller aircraft. The calculated $\dot{m}_{fuel}$ was 5−10 times larger for jets than propeller planes.

Reasonable correlations were observed between the measured peak UFP concentrations at site B and the parameter mU^3/L for aircraft departures associated with spikes in UFP concentrations measured at site B. The measured UFP concentrations and the associated aircraft code, type, weight, takeoff distance, and takeoff speed, are listed in Table 3. The squared Pearson correlation coefficient (r^2) of 0.62 indicates UFP emissions and hence concentrations are reasonably related to aircraft fuel consumption rate. In general, larger aircraft are associated with higher emissions and downwind concentrations of UFP.

Acknowledgments

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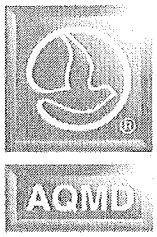

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

General Aviation Airport Air Monitoring Study: Follow-up Monitoring Campaign at the Santa Monica Airport

FINAL REPORT

April 2011

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SUMMARY REPORT

BACKGROUND AND OBJECTIVES

Between April 2006 and March 2007, the South Coast Air Quality Management District (AQMD) conducted a field study at the Santa Monica Municipal Airport (SMO) to characterize the impact of aircraft emissions and airport activities on the surrounding communities (AQMD, 2010). Ambient concentrations of total suspended particulate lead (from the leaded fuel used in piston-driven aircraft) and ultrafine particles (UFP; very small particles emitted from aircraft exhaust and other combustion processes) on-site and near SMO were found to be significantly higher than the corresponding levels present further away from the airport. Sharp and rapid increases in the concentrations of UFP occurred when jet aircraft are idling, taking off, and sometimes landing.

Recently, SMO underwent a "Pavement Rehabilitation Project" to comply with current Federal Aviation Administration (FAA) guidelines and planned airport operations. This led to a full closure of SMO between 8:00 PM, 09/19/10 and 6:00 AM, 09/24/10 to accommodate work on the runway within a restricted work area inside the airport perimeter. This temporary suspension of all airport activities presented a unique opportunity to measure the ambient concentrations of combustion-related pollutants such as UFP, black carbon (BC) and volatile organic compounds (VOC) before, during, and after the runway repaving project. Thus, a supplemental monitoring campaign was conducted by AQMD between 09/09/10 and 10/05/10 to study the short-term impact of aircraft emissions on communities surrounding SMO, and to complement the findings of our previous study more focused on long-term exposure (AQMD, 2010).

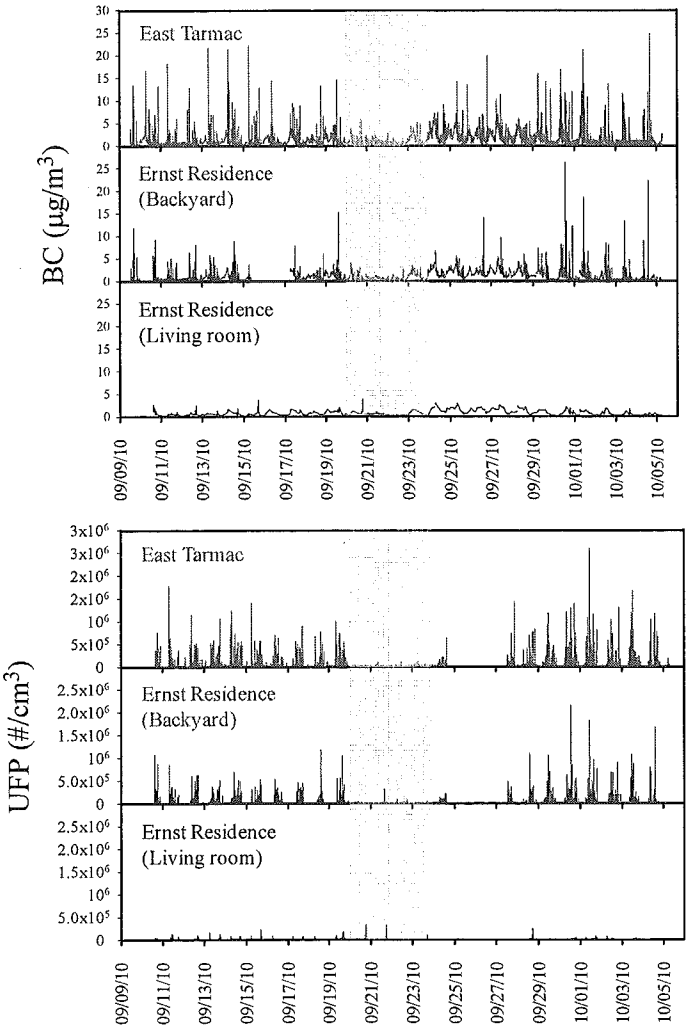
METHODS

Three monitoring stations were deployed at different distances and downwind of the airport's primary runway (# 21) on the north-east side of SMO. The East Tarmac site was about 35 m north of the end of the runway and in very close proximity to the blast-fence. The other two stations were located in the back yard of a private residence (Ernst Residence Backyard site) and in the living-room of the same home (Ernst Indoor site), at a lower elevation than the airport and approximately 100 m northeast of the end of the runway. Ultrafine particle number and BC concentration data were taken continuously at all three stations at one and five minute intervals, respectively, and complemented with measurements of ambient VOC levels. Time activity information for each departing jet and turbo-prop aircraft (i.e. registration number, model, type, weight, taxi start time, holding start time, and take-off time) were supplied by SMO and integrated in our data analysis.

RESULTS

Sharp peaks in UFP and BC caused by aircraft emissions right before and during take-off were present at both the East Tarmac and the Ernst Residence Backyard sites (Figure 1). The UFP and BC levels were typically higher near the Tarmac because of the close proximity to the aircraft point of departure. The concentrations of the same two pollutants inside Ms. Ernst's Residence were always substantially lower than those observed at the two outdoor sites, suggesting that the majority of combustion-related particles did not infiltrate indoors. Doors and windows at the Ernst Residence were kept closed for the majority of the study.

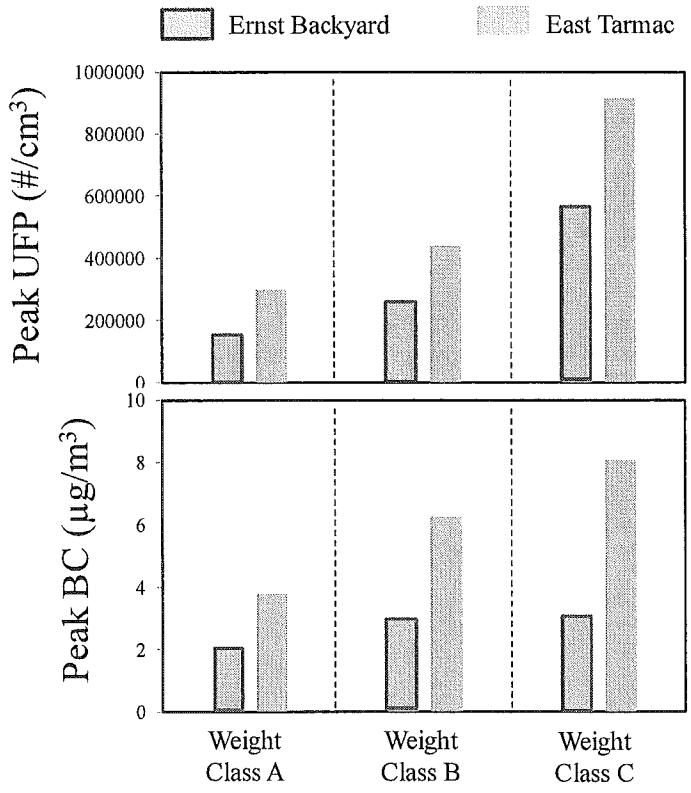
Figure 1 Ultrafine particle (UFP) and black carbon (BC) concentrations at the East Tarmac, Ernst Residence Backyard, and Ernst Residence Living room sites from 09/09/10 to 10/05/10. The shaded area corresponds to the time period when all airport activities were suspended because of the runway repaving project



The suspension of all airport activities from 09/19/10 to 09/24/10 resulted in a substantial decrease in measured UFP and BC levels at both outdoor stations. For example, the maximum UFP concentrations at the East Tarmac site before and after the repaving project were about 12 and 17 times more elevated than the highest UFP spike recorded when the airport was shut-down. Substantial reductions were also observed at the Ernst Residence Backyard site, where the maximum UFP levels measured at the Ernst Residence Backyard site before and after the runway maintenance work were approximately 4 and 7 times higher than the highest UFP peak observed when no airport activity was ongoing.

As expected, heavier aircraft (equipped with larger and more powerful engines) were found to emit the highest amounts of UFP and BC (Figure 2). In particular, the average peak UFP concentration measured for "large commuter" (>41,000 lb; weight class C), "medium commuter" (between 12,500 and 41,000 lb; weight class B) and "small equipment" (<12,500 lb; weight class A) aircraft at the East Tarmac site were about 72, 35 and 24 times higher than the average UFP level observed at the same monitoring site when SMO was shut-down. Similarly, the average peak UFP value measured for weight classes C, B and A at the Ernst Residence Backyard site were 50, 23 and 13 times higher than the average UFP concentration observed at the same monitoring station during the repaving project. A less substantial but still noticeable impact was observed for BC.

Figure 2 Bar chart showing the average peak UFP and BC concentrations for weight classes A, B, and C at the East Tarmac and Ernst Residence Backyard sites. Peak levels for each aircraft were only measured from the time the aircraft started taxing near the runway to the time of take-off

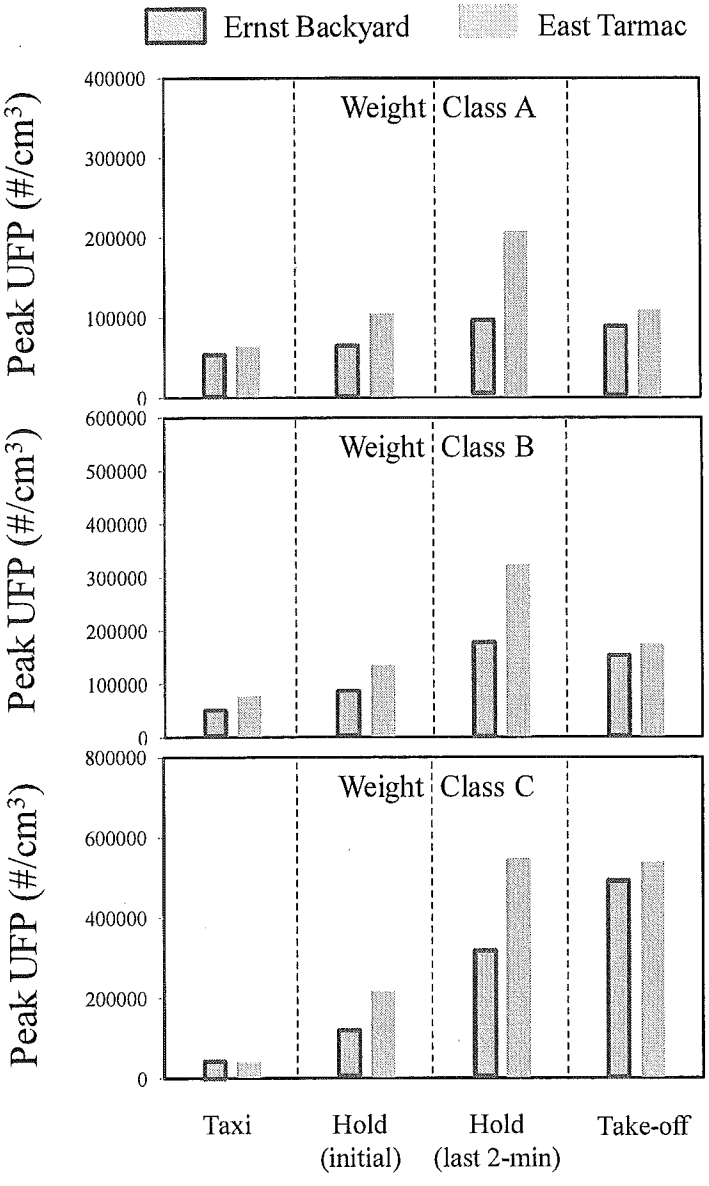


Weight Class A: < 12,500 lb
Weight Class B: 12,500 – 41,000 lb
Weight Class C: > 41000 lb

The highest UFP peaks at the East Tarmac and, to a lesser extent, at the Ernst Residence Backyard sites were typically observed within the last two minutes of the holding period and during take-off (Figure 3). An increase in UFP level right before take-off may be caused by aircraft movement from the holding area to the point of departure. During this turn, the engine thrust is increased and the combustion products are directly emitted toward the East Tarmac monitoring location. Pre-flight run-ups, a series of engine checks performed by pilots prior to take-off, may also be responsible for the observed UFP peaks. As reported on the Santa Monica Airport website, extended high power settings on run-up or departure can negatively impact air quality in the surrounding community (http://www.smgov.net/departments/airport/). These results are consistent with those obtained from our previous field study at SMO (AQMD, 2010) and during another measurement campaign conducted at the same airport by Hu et al. (2009). In all cases, when an aircraft was preparing for take-off (hence moving from the holding

to the departing area) a loud noise was typically heard near the end of runway 21, followed by a smell of fuel vapor odors, and by elevated concentrations of UFP and BC.

Figure 3 Bar chart showing the average peak UFP concentration within each of the four time activity groups considered (i.e. taxi, hold "initial", hold "last 2-min", and take-off), and at both the East Tarmac and Ernst Residence Backyard sites. All data are grouped by weight classes



The VOC samples collected during the repaving project were characterized by elevated concentrations of acetylene, ethane, and ethylene. Higher levels of these non-toxic chemicals were probably associated with increased motor-vehicle traffic due to repaving activities. After the reopening of SMO, the concentrations of all measured VOC were similar to those observed in other parts of the South Coast Basin away from the immediate influence of any specific mobile sources. Unusually high levels of pentane (not an air toxic pollutant) were observed in one of the collected canister samples. It is possible that this solvent component was used during Phase III of the pavement rejuvenation project and/or stored along with other solvents and construction material in the parking area located about 15 m north of the East Tarmac station. One of the collected VOC samples contained a detectable amount of acrolein. While this is an air toxic that has been associated with jet exhaust, the level detected in this sample was not unusual for the South Coast Air Basin. However, because of recent technical issues regarding the accuracy of the current U.S. EPA-approved methods for acrolein measurements, this acrolein level remains unverified.

CONCLUSIONS AND RECOMMENDATIONS

The results obtained from this study and those from our previous measurement campaign in 2006-2007 (AQMD, 2010) seem to suggest that airport impacts on the atmospheric levels of UFP and BC are substantial on short time scales (e.g. 1 to 5-min), but become less significant when long-term averages (e.g. several days to few months) are considered. This is because sharp short-term peaks in concentrations of UFP and BC are emitted by jet aircraft right before and during take-off. Further health effect studies are needed to better characterize the short-term risk associated with exposure to these and other combustion-related emissions. Potential mitigation measures that might be effective in reducing risks associated with exposure to aircraft-related pollutants in communities surrounding SMO may include: increasing the width of the blast fence, reducing holding times for all jet aircraft, re-directing the exhaust from pre-flight run-up tests, and limiting traffic for "large commuter" (>41,000 lb) aircraft.

ACKNOWLEDGEMENTS

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South Coast Air Quality Management District (2010), General Aviation Airport Air Monitoring Study

APPENDIX A: Technical Analysis

INTRODUCTION

Background (General Aviation Study Report)

Between April 2006 and March 2007 the South Coast Air Quality Management District (AQMD) conducted two intensive field campaigns at the Santa Monica Municipal Airport (SMO) as part of the U.S. Environmental Protection Agency (U.S. EPA) "Community-Scale Air Toxics Grant" (AQMD, 2010). The concentrations of several gaseous and particle pollutants (i.e. particulate matter, black carbon, organic carbon, lead and other trace elements, volatile organic compounds and carbonyls) and some of their physical and chemical characteristics (e.g. number of ultrafine particles) were measured using real-time and time-integrated instruments at multiple monitoring stations set-up inside and at different distances from the airport perimeter. The resulting data were analyzed to determine if the study area and the surrounding communities experienced ambient air toxic concentrations or gradients that could be attributed to aircraft emissions/airport activities and/or to other potential sources of air pollution such as roadways.

Overall, the most significant airport-related impacts on air quality were observed for total suspended particulate (TSP) lead (from the leaded fuel used in piston-driven aircraft) and for ultrafine particles (UFP; particles with an aerodynamic diameter less than 100 nm, emitted primarily from combustion sources). Study-average concentrations of these two pollutants near SMO were found to be significantly higher than the corresponding levels present in background air or elsewhere in the Basin, and the concentration gradients indicated the runway take-off area as the source. Near-continuous measurements obtained during this and other field campaigns have shown that sharp and rapid increases (e.g. 1-min) in the concentrations of UFPs occur when jet aircraft are idling, taking off, and sometimes landing. At SMO in the spring/summer of 2006, overall average UFP levels recorded near the blast-fence were over six times higher than those in background air. Our analysis of aircraft activity data at SMO confirmed that short-term peaks in UFP concentration at the downwind sites were associated with jet aircraft take-off operations. These short-lived spikes in UFP levels were up to 2,000 times higher than background levels, and often extended into residential areas.

The mass concentrations of elemental carbon (EC; closely related to black carbon or BC) at all Santa Monica stations were at or below the corresponding South Coast Basin averages. Comparisons among sampling sites did not show any discernable spatial gradient that could be attributed to aircraft operations. However, the concentration of this important pollutant was measured from the analysis of integrated (24-hr) filter samples, and short-term variations due to aircraft emissions and other airport activities are more likely to be observed when using near-continuous BC monitors.

Repaving Project

Recently, SMO underwent a "Pavement Rehabilitation Project" to comply with current Federal Aviation Administration (FAA) guidelines and planned airport operations. The project consisted of various paving improvements in and around the runway area, including: a) rubber removal from the surface of the runway, b) removal of existing striping and pavement marking from all airside areas (e.g. runway and taxiways), c) removal of a delaminating slurry seal application in one of the infield areas, d)

pavement rejuvenation of the existing grooved asphalt runway and Taxiway B, and e) restriping and remarking of all airside areas including the runway and taxiways. The initial preparatory work for the repaving project (Phase I) was conducted over a period of five consecutive nights preceding the suspension of all operation activities, from 9/14/10 to 9/19/10. During this initial phase, the airport was closed at night, but daytime operations continued as normal. Following this initial phase, a full closure of the airport for five consecutive days was required from 9/19/10 at 8:00 pm to 9/24/10 days 6:00 am (Phase II) to accommodate work on the runway and within the restricted work area (150 feet on either side of the runway centerline). Following the reopening of SMO, construction outside the restricted work perimeter was then completed over a period of ten consecutive days, from 9/25/10 to 10/5/10 (Phase III). During this final phase, the airport was closed again at night, but resumed normal operations during the day. To comply with FAA specifications, the second application of runway and airside markings was installed over a period of three consecutive nights, approximately one or two weeks after completion of all previous work. Table 1 shows a summary of the runway closure schedule. All time information here and elsewhere within this document are in Pacific Standard Time (PST)

Table 1 Runway closure schedule during the "Pavement Rehabilitation Project" conducted at SMO

Phase I – Airport Closures
09/14/2010 8:00 pm – 09/15/2010 6:00 am
09/15/2010 8:00 pm – 09/16/2010 6:00 am
09/16/2010 8:00 pm – 09/17/2010 6:00 am
09/17/2010 8:00 pm – 09/18/2010 6:00 am
09/18/2010 8:00 pm – 09/19/2010 6:00 am
Phase II – Airport Closures
09/19/2010 8:00 pm – 09/24/2010 6:00 am
Phase III – Taxiway & Infield Area Closures
09/25/2010 – 10/5/2010 (airport will remain open)

Objectives of the Present Study

This temporary suspension of all airport activities presented a unique opportunity to measure concentrations of important air toxics such as UFP, BC, and volatile organic compounds (VOC) both with and without aircraft activity. For this reason, a follow-up study was conducted by AQMD between 09/09/10 and 10/05/10 in order to better characterize the impact of aircraft emissions and airport activities on communities surrounding SMO, complementing the findings of our previous study that was more

focused on long-term exposure. Furthermore, this follow-up field work was designed to characterize the short-term impacts of specific aircraft activities on nearby communities, and our measurements were complemented by detailed aircraft information (e.g. type, model, and weight) and traffic activity data (i.e. taxi, hold and departure times) taken by SMO personnel throughout the entire duration of the study. The recorded traffic information includes departing jet and turbo-prop aircraft only. Piston engine aircraft activities were not tracked, but previous studies have shown these aircraft emit considerably less BC and UFP than jets.

METHODS

Three monitoring stations were set-up at different distances and downwind of runway 21, on the north-east side of SMO (Figure 1). Runway 21 is the airport's primary runway, with aircraft landing and departing to the west. Runway 3 (on the south-west side of SMO) is used only a few days out of the year when the Los Angeles Basin is experiencing Santa Ana wind conditions. The East Tarmac site was approximately 35 m north of the end of runway 21, on the north-east perimeter of the airport and in very close proximity to the blast-fence. The other two sites were located in the back yard of a private residence (Ernst Residence Backyard site; 12130 Sardis Ave., Los Angeles) and in the living-room of the same home (Ernst Indoor site), directly under the fixed wing arrival/departure route, at a lower elevation than the airport, and approximately 100 m northeast of the end of the runway.

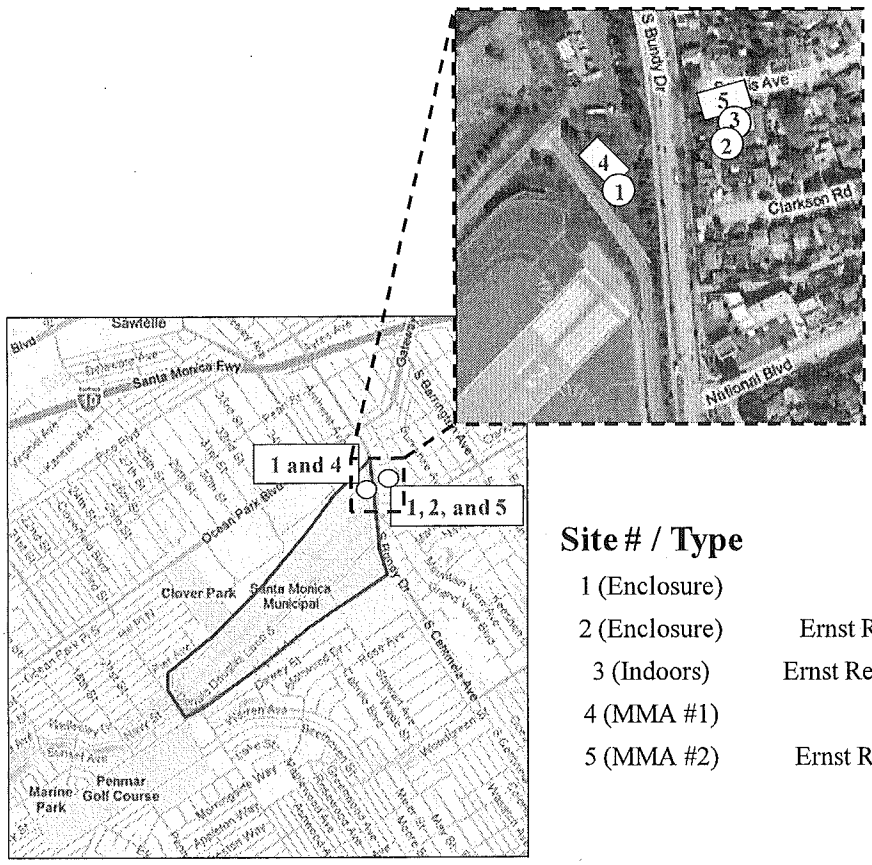
All three stations were equipped with a Continuous Particle Counter (CPC; TSI Model 3785) for UFP number measurements and with a portable Aethalometer for monitoring BC (Magee Scientific Model AE42). Both instruments were set-up inside a portable water-proof enclosure (i.e. East Tarmac and Ernst Backyard sites) or on a table away from any potential indoor PM sources such as the kitchen (i.e. Ernst Indoor site). Unlike the CPCs employed during the previous field campaign (TSI Model 3781, characterized by a detectable particle range between 0 and ~500,000 #/cm^3) the CPCs used for this study are able to measure UFP number concentrations up to 10,000,000 #/cm^3, and are more suited for measuring aircraft emissions near taxi and take-off areas.

In addition to these three "core" sites, two mobile measurement stations (MMS) were also deployed, one at the East Tarmac site and one in front of the same private residence (Ernst Front yard) (Figure 1). The two MMS were equipped with a Baseline-Mocon series 9000 NMHC monitor (Mocon, Inc.) to measure the atmospheric concentration of methane and non-methane hydrocarbons (NMHC) continuously. This, in conjunction with a Xontech 912 Multi-Canister sampling system (Xontech, Inc.), allowed for triggering the instantaneous collection of Silonite-Lined Canister samples that were then analyzed at the AQMD lab for the presence of the VOC most commonly found in urban areas using a Gas Chromatography (GC) - Mass Spectrometry (MS) or Flame Ionization Detection (FID) method (TO-15). The collection time for these canister samples was five minutes.

All meteorological data (i.e. wind speed, wind direction, temperature and relative humidity) were supplied by SMO along with time activity information for each aircraft departing from the airport during the entire duration of the study. This included: aircraft

registration number, aircraft model and type (i.e. jet or turbo-prop), taxi start time, holding start time, and take-off time.

Figure 1 Map of the Santa Monica Airport (SMO) sampling sites. The measurement devices were set-up inside portable enclosures (sites 1 and 2), in the living room of a private residence (site 3), and inside two Mobile Measurement Stations (MMS; sites 4 and 5)



Site # / Type	Location
1 (Enclosure)	East Tarmac
2 (Enclosure)	Ernst Residence (Backyard)
3 (Indoors)	Ernst Residence (Living-room)
4 (MMA #1)	East Tarmac
5 (MMA #2)	Ernst Residence (Front yard)

The sampling campaign was conducted between 09/09/10 to 10/05/10 and was divided into three phases to study changes in the ambient levels of the monitored air pollutants before, during and after the completion of the repaving project: from 09/09/10 to 09/20/10 (Phase 1, before repaving), from 09/20/10 to 09/24/10 (Phase 2, during repaving), and from 09/24/10 to 10/05/10 (Phase 3, after repaving).

The atmospheric concentrations of UFP (#/cm^3) and BC (mass; μg/m^3) were measured continuously at sites 1, 2 and 3 at one and five minute intervals, respectively. Continuous 1-min NMHC concentrations and 5-min canister samples for VOC analysis (collected only when the NMHC and/or methane levels were higher than 3 and 5 ppm, respectively) were obtained only at the two MMS (sites 4 and 5). The data files were

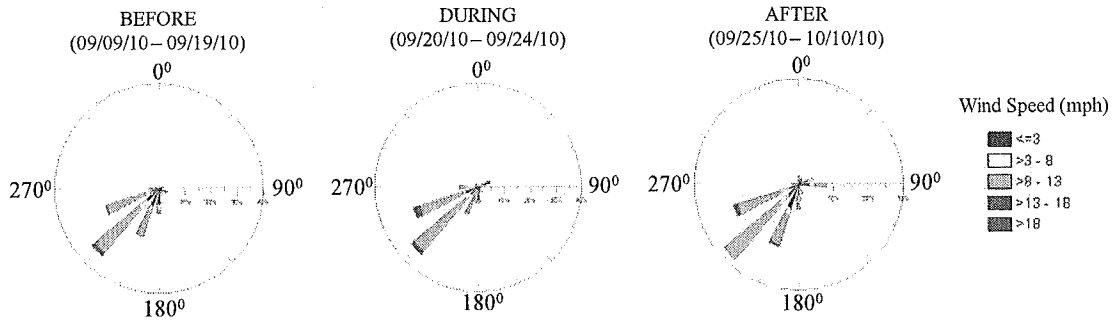
periodically downloaded to a laptop computer and transferred to the AQMD's central database.

RESULTS AND DISCUSSION

Meteorology

As expected, the wind data collected during this study show the presence of a distinct daytime sea breeze, characteristic of beach communities in the South Coast Air Basin. As shown in Figure 2, winds were from southwest before, during and after the completion of the repaving project, and sites 1 through 5 were predominantly downwind of runway 21.

Figure 2 Average wind speed and direction at the Santa Monica Airport (SMO) before, during and after the completion of the repaving project



Air Traffic and Time Activity Information

Typically, aircraft follow a series of procedures to move from the taxi area, located a few hundred meters away and north of runway 21, to the point of departure. Prior to engine start, pilots are requested to call Ground Control for clearance. If a departure delay is anticipated, the controller informs the pilot of the aircraft's expected departure release time. When Ground Control receives the release time from the Los Angeles International Airport (LAX), the release is forwarded to the pilot, and taxi and hold instructions are issued based on the anticipated delay. Due to proximity to a residential area, fixed-wing turbine aircraft are requested to hold approximately 70 m from the end of runway 21, while awaiting departure clearance. At this point, the aircraft is positioned parallel to the runway with the engine exhaust facing west towards the airport. When permission to take-off is granted, aircraft turn to the departure area (with the engine exhaust facing east towards the nearby residential community) and take-off shortly thereafter.

All air traffic and time activity information for jet and turbo-prop aircraft departing between 09/12/10 and 10/03/10 were provided by SMO and are summarized in Table 2 (see Appendix A for more details). No landing information was provided. Based on data from 18 measurement days (from 09/12/10 to 09/19/10 and between 09/24/10 and

10/03/10), there were a total of 371 take-offs from runway 21 and only one from runway 3. The majority (about 79%) of all departing airplanes was represented by small and medium size jet aircraft. As shown in Table 2 the average taxi time was about three minutes, much longer than the acceleration time on the runway during take-off (20 to 25 seconds). Because the jet flight path from SMO intersects LAX flight paths less than 20 km after take-off, aircraft departing from SMO must wait for permission from LAX, resulting in an additional waiting time. The total waiting time observed for an average airplane ("Grand Total" in Table 2) during our field campaign was between approximately two and 16 minutes (5^{th} and 95^{th} percentile, respectively; the median waiting time was about six minutes).

Table 2 Summary statistics of traffic activity data recorded at SMO from 09/12/10 to 10/03/10

	Taxi	Hold	Grand Total (Taxi + Hold)
Average	0:02:42	0:04:14	0:06:56
Median	0:02:32	0:02:57	0:05:43
5th %	0:01:22	0:00:25	0:02:28
95th %	0:04:21	0:12:43	0:15:31
Min	0:00:00	0:00:08	0:01:13
Max	0:18:21	0:44:05	0:45:51
Stdev	0:01:24	0:04:31	0:04:46
Valid N	372	372	372

Ultrafine Particle and Black Carbon Variations

The time series in Figure 3 shows that the UFP and BC data collected at the SMO stations were dynamic in range, with significant variability over very short temporal and spatial scales. Sharp peaks in the atmospheric levels of these two combustion products were present at both the East Tarmac and the Ernst Residence Backyard sites and were mostly related to aircraft emissions right before and during take-off, as will be described in more detail in a later section. The concentrations of UFP and BC at the two outdoor stations tracked each other well and were typically higher near the Tarmac because of the close proximity to the aircraft point of departure.

The highest UFP concentration observed during this study was about 2,600,000 #/cm^3 (Table 3) and it was measured at the East Tarmac site on 10/01/10 at 10:27 am. One minute maxima between 1,500,000 and 2,000,000 #/cm^3 were also observed at the Ernst Residence Backyard site, but were not as frequent. The UFP peaks measured inside Ms. Ernst's Residence were always substantially lower than those observed at the two outdoor sites, and the few 1-min peaks above 200,000 #/cm^3 were caused by indoor afternoon activities such as cooking and cleaning, as noted by Ms. Ernst. Interestingly, the highest 5-min average BC concentration (26.2 μg/m^3; Table 3) observed during this study was recorded at the Ernst Residence Backyard site, about 100 m downwind from the runway but in close proximity to Bundy Dr. and National Blvd, two highly trafficked streets adjacent to the north-east side of the airport. However, BC maxima of 10 μg/m^3 or

higher were more frequent at the East Tarmac site (Figure 3). As was the case for UFP, the BC concentration inside Mr. Ernst's Residence was substantially lower than that at the two outdoor sampling locations, suggesting that the majority of combustion-related particles did not infiltrate indoors. Doors and windows at the Ernst Residence were kept closed for the majority of the study.

The suspension of all airport activities from 09/19/10 at 8:00 pm to 09/24/10 at 6:00 am caused a substantial decrease in the measured 1-min UFP and 5-min BC peaks at all outdoor stations (see shaded area in Figure 3). For example, the maximum UFP concentrations measured at the Ernst Residence Backyard site before and after the runway maintenance work were 1,168,000 and 2,148,460 #/cm^3, respectively (Table 3), 3.8 and 6.9 times higher than the highest UFP peak observed when no airport activity was ongoing (background). More significant reductions were observed at the East Tarmac site, where the maximum UFP concentrations before and after the repaving project were 11.7 and 17.2 times more elevated than the highest UFP spike recorded when the airport was shut-down.

It is worth noting that the full closure of SMO had a less substantial impact on the longer-term average UFP and BC levels observed at two outdoor sites. For instance, the mean UFP concentration measured both at the Ernst Residence Backyard and at the East Tarmac stations before the airport shut-down (20,861 and 23,825 #/cm^3, respectively; Table 3) and after the runway repaving work (23,741 and 26,863, respectively) were only about two times higher than the corresponding average UFP count at the same stations (11,260 and 12,630, respectively) when no aircraft activity was occurring. Thus, the results from this study and those obtained during our previous measurement campaign in 2006-2007 (AQMD, 2010) seem to suggest that airport impacts on the atmospheric levels of UFP appear to be less when considering long-term averages (i.e. several days or a few months). However, impacts for the same pollutant are much more significant when shorter time scales (e.g. 1-min) are considered. Similar conclusions can be drawn for BC. Ultrafine particles and BC are currently not regulated pollutants, and further investigation is needed to characterize the short-term risk associated with exposure to these and other combustion-related emissions.

Figure 3 Ultrafine particle (UFP) number and black carbon (BC) mass concentrations at the East Tarmac, Ernst Residence Backyard, and Ernst Residence Living room stations from 09/09/10 to 10/05/10. Ultrafine particle and BC data were measured continuously at 1- and 5-min intervals, respectively. The shaded area corresponds to the time period when all airport activities were suspended to accommodate work on the runway and within the restricted work area (i.e. 9/19/10 at 8:00 pm to 9/24/10 days 6:00 am)

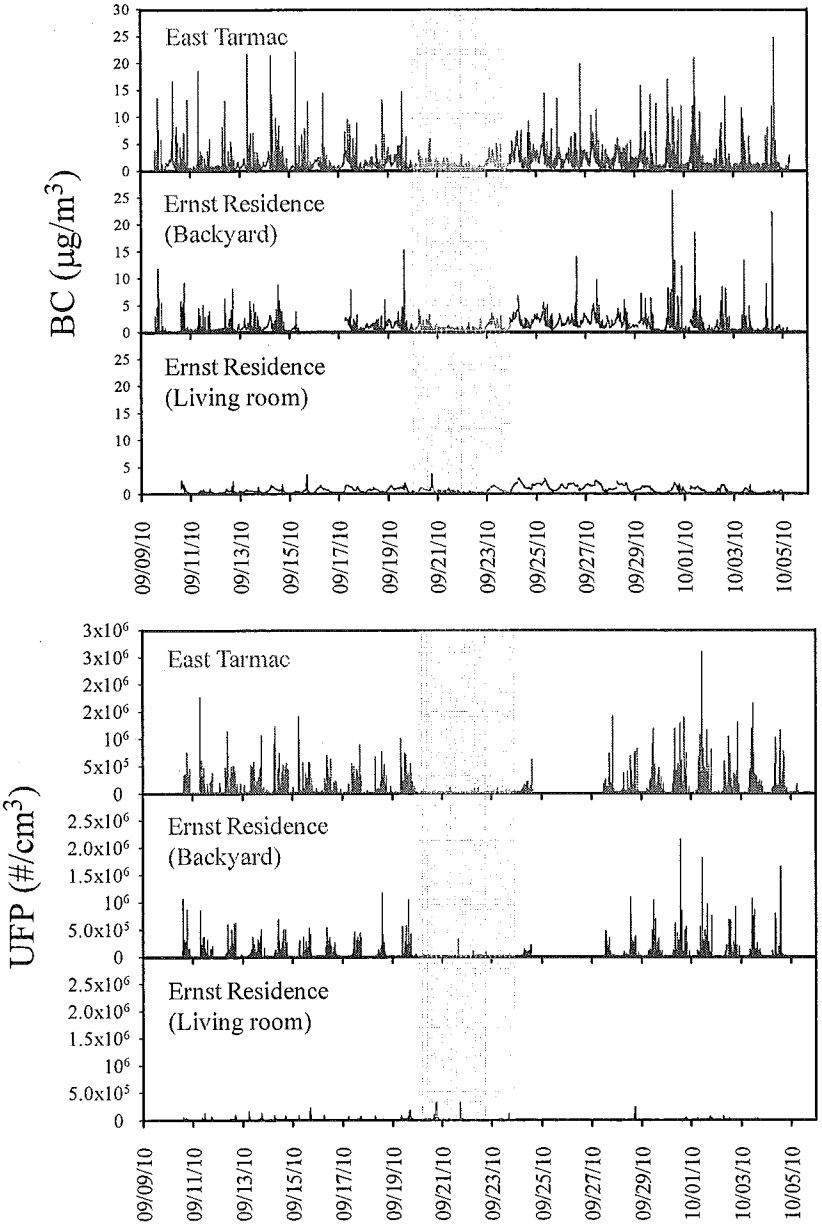


Table 3 Average and median ultrafine particle (UFP) number and black carbon (BC) mass concentrations measured at the East Tarmac, Ernst Residence Backyard, and Ernst Residence Living stations before, during and after the runway repaving project. Minimum (Min) and maximum (Max) values, standard deviations (SD), and total number of valid samples (Valid N) have also been included for each pollutant

	UFP (#/cm^3)								
	EAST TARMAC			ERNST RESIDENCE (BACKYARD)			ERNST RESIDENCE (INDOORS)		
	Before[1]	During[2]	After[3]	Before[1]	During[2]	After[3]	Before[1]	During[2]	After[3]
Average	23,825	12,630	26,863	20,861	11,260	23,741	11,217	12,173	7,933
Median	9,156	9,603	12,440	10,265	9,944	12,503	6,402	6,115	5,340
Min	1,205	1,543	833	981	1,232	1,088	301	826	315
Max	1,763,280	151,273	2,595,020	1,168,000	309,840	2,148,460	210,453	330,183	230,282
Stdev	62,869	11,059	75,243	44,126	8,954	61,138	17,188	26,796	11,926
Valid N	13,360	6,360	11,700	13,429	6,360	11,511	13,321	6,359	10,486

	BC (μg/m^3)								
	EAST TARMAC			ERNST RESIDENCE (BACKYARD)			ERNST RESIDENCE (INDOORS)		
	Before[1]	During[2]	After[3]	Before[1]	During[2]	After[3]	Before[1]	During[2]	After[3]
Average	0.98	1.06	1.47	0.79	0.93	1.22	0.63	0.66	0.91
Median	0.57	0.71	1.04	0.52	0.62	0.91	0.51	0.48	0.79
Min	0.00	0.00	0.00	0.01	0.01	0.01	0.14	0.14	0.14
Max	22.13	7.22	24.62	15.24	6.58	26.19	3.55	3.76	2.76
Stdev	1.51	1.13	1.77	0.91	0.91	1.32	0.39	0.51	0.60
Valid N	2,933	1,242	3,092	2,233	1,248	3,077	2,654	1,254	3,093

[1]From 09/09/10 to 09/19/10 8:00 pm; [2]Background: from 09/19/10 8:00 pm to 09/24/10 6:00 pm; [3]from 09/24/10 6:00 pm to 10/
All time information is in Pacific Standard Time (PST)

The effect of aircraft activity on the magnitude of the UFP number and BC mass concentrations measured at the East Tarmac and Ernst Residence Backyard sites is illustrated in Figure 4, which shows typical times series for these two pollutants on 10/01/10 from 8:00 am to 12:30 pm. As expected, measurements at the East Tarmac and Ernst Residence sites peaked when aircraft were taking-off or holding on the runway right before departure. These time periods (corresponding to the broken lines in Figure 4) are listed in Table 4, which also includes detailed information about the identification number, model type (jet or turbo-prop), weight, and time activity data for aircraft associated with these increases in UFP and BC levels. AQMD staff members operating at the East Tarmac and Ernst Residence Backyard sites reported that observations of particle count peaks right before and during take-offs corresponded with visual sightings of aircraft preparing for departure, with a short delay between the activity and the peak count recorded on the instrument (often accompanied by an odor of jet-fuel).

Figure 4 Impact of aircraft movements on the ultrafine particle (UFP) number and black carbon (BC) mass concentrations at the East Tarmac and Ernst Residence Backyard sites on 10/01/10

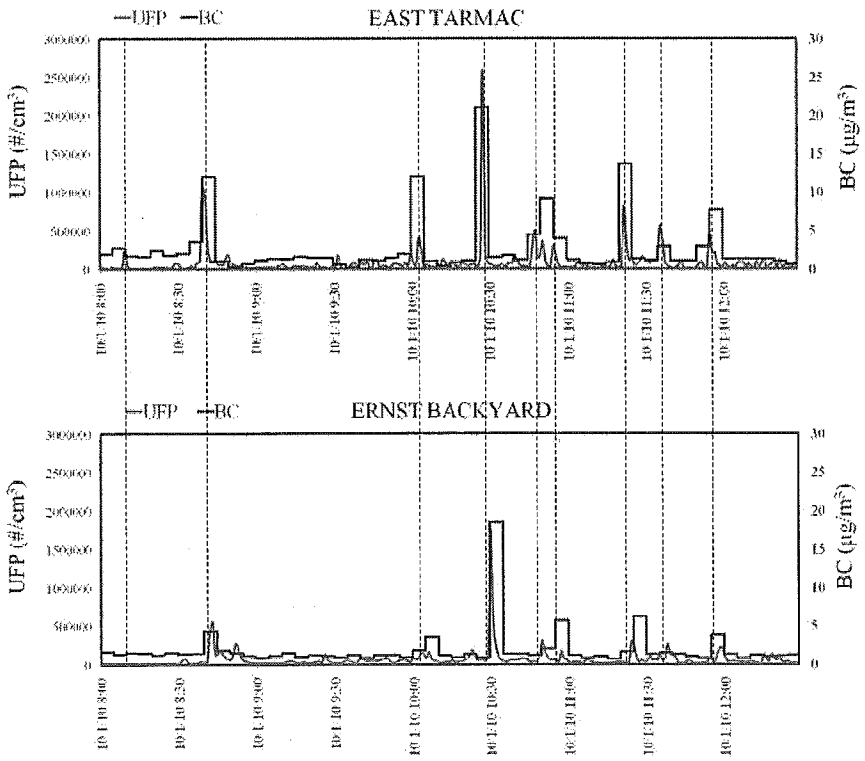


Table 4 Traffic activity data recorded at SMO on 10/01/10. The letters "J" and "T" designate jet and turbo-prop aircraft, respectively

Aircraft No.	Aircraft Model / Type	Aircraft Weight	Taxi Begins (a)	Hold Begins (b)	Departure Time (c)	Total Taxi (b-a)	Total Hold (c-b)	Grand Total (c-a)
417Q	Cessna 525 / J	9,800	8:05:12	8:09:56	8:10:14	0:04:44	0:00:18	0:05:02
642JL	Beechcraft 300 / T	14,000	8:27:23	8:31:10	8:40:55	0:03:47	0:09:45	0:13:32
122QS	Reytheon 400A / J	16,300	10:00:48	10:02:42	10:04:20	0:01:54	0:01:38	0:03:32
480QS	Gulfstream IV / J	58,500	10:21:09	10:25:31	10:28:21	0:04:22	0:02:50	0:07:12
852LX	Raytheon Hawker 800 / J	21,200	10:44:59	10:47:31	10:48:13	0:02:32	0:00:42	0:03:14
819AP	Gulfstream G200 / J	30,000	10:48:18	10:50:26	10:55:26	0:02:08	0:05:00	0:07:08
614BA	Bombardier CL600 / J	36,000	11:18:17	11:20:56	11:22:51	0:02:39	0:01:55	0:04:34
969WR	Gulfstrea G150 / J	26,250	11:25:38	11:28:05	11:36:47	0:02:27	0:08:42	0:11:09
409CS	Cessna 525B / J	9,800	11:53:06	11:55:12	11:55:45	0:02:06	0:00:33	0:02:39

Effect of Aircraft Weight on Measured Ultrafine Particle and Black Carbon Levels

To better identify which aircraft type contributed the most to the particulate pollutant emissions observed in and around SMO, the weights of each aircraft (retrieved from the FAA website; http://rgl.faa.gov) were segregated into the following three categories according to the Enhanced Traffic Management System (ETMS) Data Services guidelines: small equipment (<12,500 lb; weight class A), medium commuter (between 12,500 and 41,000 lb; weight class B) and large commuter (>41,000 lb; weight class C). The heaviest jet aircraft operated at SMO during this study was a Gulfstream 4 weighing about 58,500 lb. Heavier and larger airplanes are generally too big in size to land at or take-off from SMO. The weight of each aircraft in each weight class was then matched to the corresponding maximum UFP number and BC mass concentrations measured from the time the aircraft started taxing near the runway to the time of take-off. A box plot summarizing the distribution of the peak UFP and BC levels for weight classes A, B, and C at both the East Tarmac and the Ernst Residence Backyard sites is shown in Figure 5; the corresponding summary statistics can be found in Table 5.

As expected, the average peak UFP and BC values increased with increasing aircraft weight, both at the East Tarmac and Ernst Residence Backyard stations, suggesting that heavier aircraft (equipped with larger and more powerful engines) emit higher amounts of combustion particles (Figure 5). Specifically, the average peak BC concentration measured for weight classes C, B and A at the East Tarmac site were about 7.6, 5.9 and 3.5 times higher than the average BC concentration observed at the same monitoring site from 09/19/10 to 09/24/10 (1.06 $\mu g/m^3$; Table 3) when no airport / aircraft activity was ongoing. The average peak BC value measured for weight classes C, B and A at the Ernst Residence Backyard site were 3.3, 3.2 and 2.2 times higher than the average BC concentration observed at the same site during the repaving project (0.93 $\mu g/m^3$; Table 3), when particle contributions from aircraft emissions were absent. A more substantial impact was observed for UFP; in particular, the average peak UFP concentration measured for weight classes C, B and A at the East Tarmac site were about 72, 35 and 24 times higher than the average UFP concentration observed at the same monitoring site when no airport / aircraft activity was ongoing (12630 $\#/cm^3$; Table 3). Similarly, the average peak UFP value measured for weight classes C, B and A at the Ernst Residence Backyard site were 50, 23 and 13 times higher than the average UFP concentration observed at the same site during the repaving project (11260 $\#/cm^3$; Table 3).

Figure 5 Box plot summarizing the distribution of the peak (maximum) UFP and BC levels for weight classes A, B, and C at both the East Tarmac and Ernst Residence Backyard sites. The dotted black lines represent the corresponding average UFP and BC levels measured during the repaving project, when all airport/aircraft activities were suspended

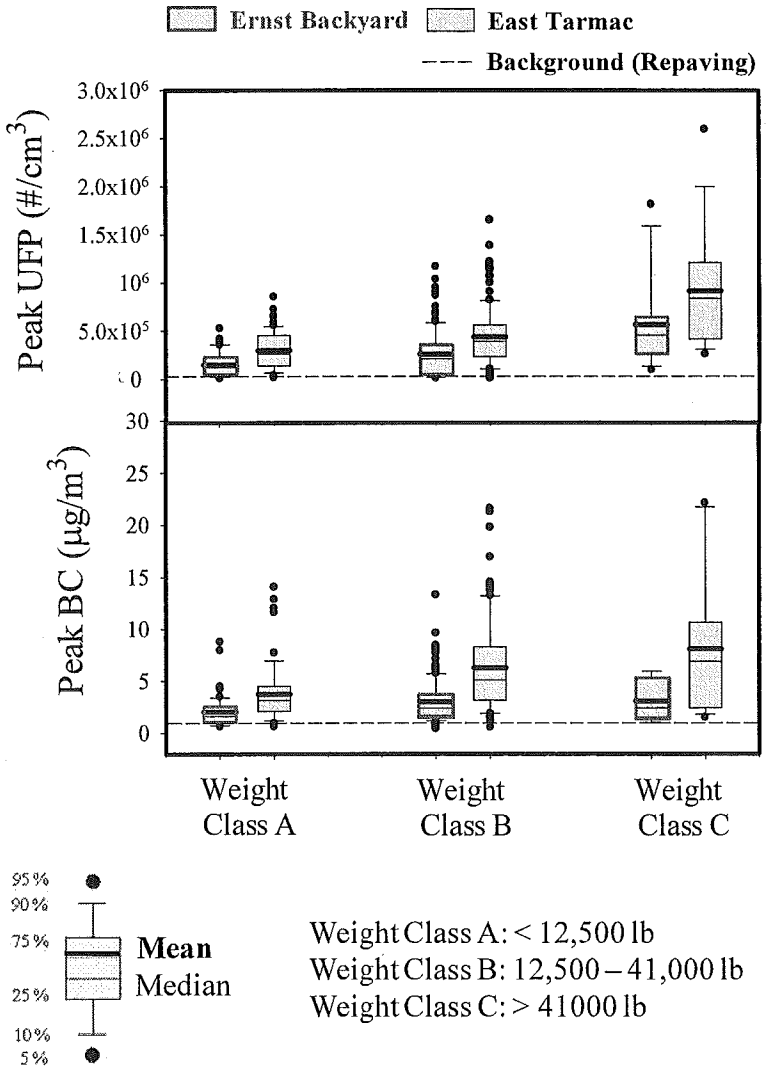


Table 5 Summary statistics for the peak (maximum) UFP and BC levels corresponding to weight classes A, B, and C at both the East Tarmac and Ernst Residence Backyard sites. Peak levels for each aircraft were measured from the time the aircraft started taxing near the runway to the time of take-off

	Peak UFP (#/cm^3)					
	EAST TARMAC			ERNST RESIDENCE (BACKYARD)		
	Weight Class			*Weight Class*		
	A	*B*	*C*	*A*	*B*	*C*
Average	297,989	437,699	915,116	148,648	258,144	566,172
Median	261,073	390,383	837,467	120,138	207,655	452,250
5th %	31,647	69,608	325,568	14,232	14,627	162,046
95th %	600,698	1,067,395	1,820,110	370,665	685,429	1,401,906
Min	15,913	8,599	255,478	7,077	8,619	94,650
Max	856,817	1,652,720	2,595,020	529,518	1,168,000	1,815,330
Stdev	193,047	292,783	601,545	117,387	234,444	467,294
Valid N	78	155	14	76	153	12

	Peak BC (μg/m^3)					
	EAST TARMAC			ERNST RESIDENCE (BACKYARD)		
	Weight Class			*Weight Class*		
	A	*B*	*C*	*A*	*B*	*C*
Average	3.75	6.27	8.06	2.03	3.00	3.04
Median	3.15	5.11	6.90	1.61	2.39	2.40
5th %	0.83	1.48	1.93	0.70	0.83	1.13
95th %	11.70	14.17	21.51	4.31	6.59	5.86
Min	0.62	0.57	1.48	0.62	0.41	0.99
Max	14.06	21.59	22.13	8.79	13.30	5.93
Stdev	2.91	4.31	6.75	1.54	2.02	1.96
Valid N	57	130	13	55	119	9

Effect of Aircraft Activity on Measured Ultrafine Particle Levels

To better characterize which type of aircraft activity contributed the most to the UFP emissions measured at the East Tarmac and Ernst Residence Backyard sites, time activity information for each aircraft monitored during the study period (listed in Table A1; see Appendix) was divided into the following groups: taxi (time period during which an aircraft was waiting near the runway), hold "initial" (from the beginning of the holding period and up to two minutes before departure), hold "last 2-min" (including only the last two minutes of holding time), and take-off. For each aircraft and within each time activity group the peak (maximum) UFP number concentration measured at the East Tarmac and Ernst Residence Backyard stations were then identified, categorized by weight classes, and summarized in a box plot as shown in Figure 6; the corresponding summary statistics can be found in Table 6. Because the taxi and hold time for most aircraft was typically between two and three minutes and due to the relatively lower time resolution of the BC mass concentration data (5-min vs 1-min for UFP), similar box plots could not be obtained for this carbonaceous component of PM.

Our results indicate that the highest UFP peaks at the East Tarmac and Ernst Residence Backyard sites were typically observed within the last two minutes of the holding period (particularly for aircraft weighing less than 41,000 lb) and during take-off (especially following the departure of a aircraft weighing more than 41,000) (Figure 6). An increase in UFP level right before take-off may be caused by aircraft movement from the holding area to the point of departure, for during this turn the engine thrust is increased and the combustion products are directly emitted towards the East Tarmac monitoring station. Measurements at the Ernst Backyard site are less subject to this very local directionality of emissions, but the higher peak UFP levels during the last 2-minutes of hold time vs. those at take-off are still discernable for Weight Classes A and B.

Pre-flight run-ups, a series of engine checks performed by pilots prior to take-off, may also be responsible for the observed UFP peaks. These often involve temporarily advancing the throttles to ensure that the engine is capable of producing enough take-off thrust. Run-up tests typically occur in two dedicated areas a few meters away from the runway end, in front of a sound attenuation wall, and not far from our East Tarmac sampling station (Figure 7). As reported on the Santa Monica Airport website extended high power settings on run-up or departure can negatively impact air quality in the surrounding community (http://www.smgov.net/departments/airport/).

These results are in line with those obtained from our previous field study at SMO (AQMD, 2010) and during another measurement campaign conducted at the same airport by Hu et al. (2009). In all cases, when an aircraft was preparing for take-off (hence moving from the holding to the departing area) a loud noise was typically heard near the end of runway 21, followed by a smell of fuel vapor odors, and by elevated concentrations of UFP and BC.

Figure 6 Box plot summarizing the distribution of the peak UFP levels for various time activity groups and weight classes at both the East Tarmac and Ernst Residence Backyard sites. The dotted lines represent the corresponding average UFP and BC levels measured during the repaving project, when all airport/aircraft activities were suspended

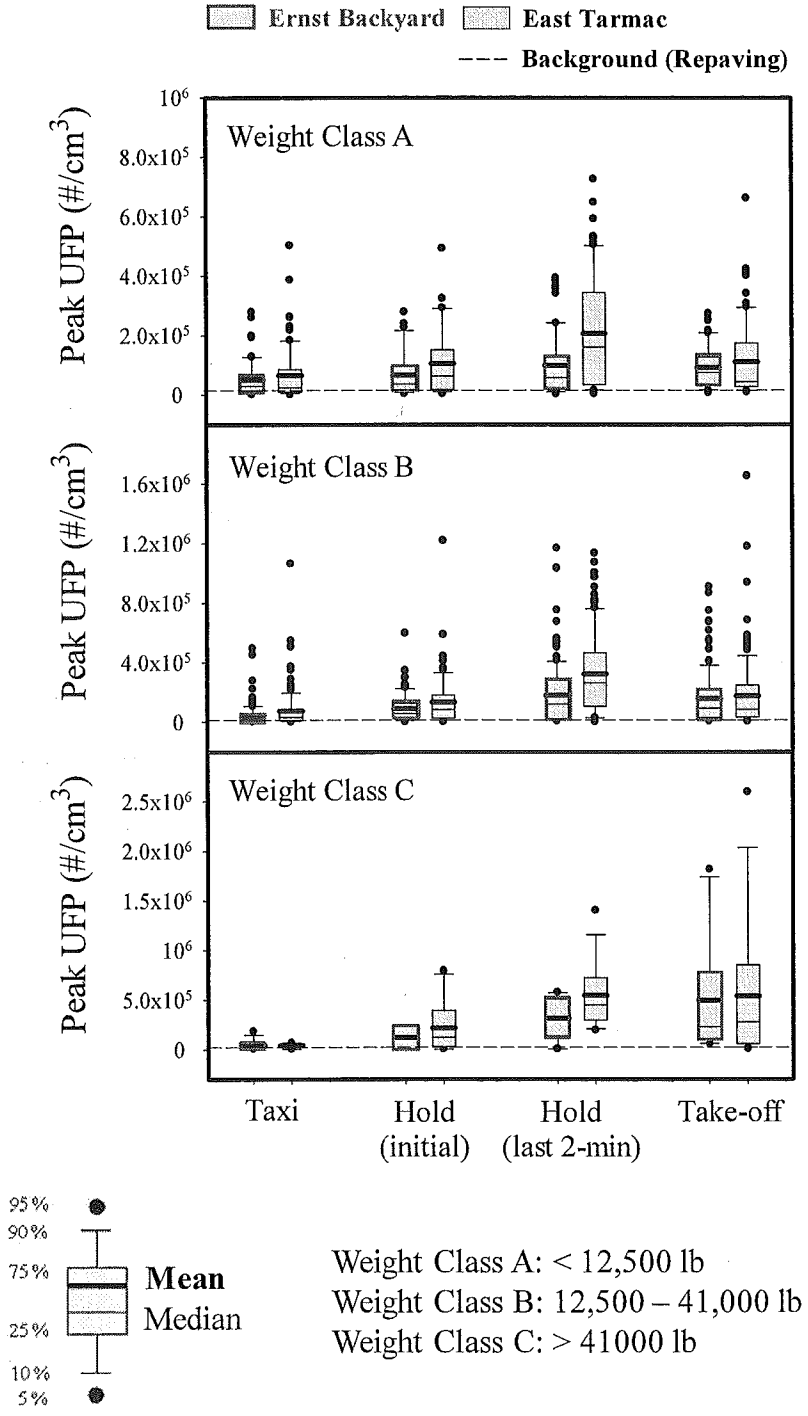


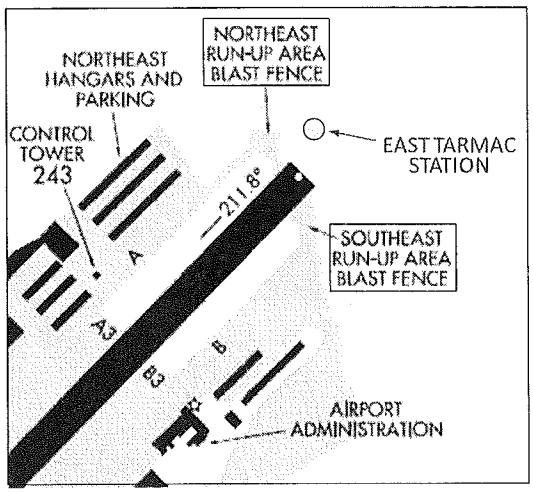
Table 6 Summary statistics for the peak (maximum) UFP levels corresponding to various time activity groups and weight classes at both the East Tarmac and Ernst Residence Backyard sites

	Peak UFP (#/cm^3) for Weight Class A							
	EAST TARMAC				ERNST RESIDENCE (BACKYARD)			
	Taxi	*Hold (initial)*	*Hold (last 2-min)*	*Takeoff*	*Taxi*	*Hold (initial)*	*Hold (last 2-min)*	*Takeoff*
Average	64,126	104,492	206,329	109,804	50,590	65,495	98,248	90,441
Median	23,667	62,935	159,478	43,959	28,608	35,820	57,148	74,253
5th %	4,025	8,371	12,997	11,252	5,971	6,419	5,394	13,728
95th %	245,900	298,698	529,434	371,621	164,720	232,643	358,230	234,682
Min	1,255	4,096	3,891	9,184	2,101	4,264	2,597	7,077
Max	503,139	492,813	726,262	662,367	278,850	279,183	393,433	274,050
Stdev	92,586	111,593	189,093	129,877	57,576	73,371	105,019	70,767
Valid N	71	37	71	71	70	33	70	70

	Peak UFP (#/cm^3) for Weight Class B							
	EAST TARMAC				ERNST RESIDENCE (BACKYARD)			
	Taxi	*Hold (initial)*	*Hold (last 2-min)*	*Takeoff*	*Taxi*	*Hold (initial)*	*Hold (last 2-min)*	*Takeoff*
Average	76,319	133,893	323,594	174,013	47,043	89,525	178,794	157,117
Median	32,380	84,288	261,310	84,282	22,652	57,412	121,083	93,103
5th %	5,027	9,434	14,165	8,916	6,427	11,887	8,937	11,881
95th %	288,755	363,862	851,932	547,516	152,257	253,583	536,424	552,887
Min	2,097	2,714	3,004	3,825	3,378	2,768	5,207	7,123
Max	1,065,010	1,219,400	1,134,990	1,652,720	496,133	598,000	1,168,000	909,633
Stdev	131,667	172,835	274,324	234,316	71,009	102,209	198,874	184,001
Valid N	125	82	124	125	125	61	123	125

	Peak UFP (#/cm^3) for Weight Class C							
	EAST TARMAC				ERNST RESIDENCE (BACKYARD)			
	Taxi	*Hold (initial)*	*Hold (last 2-min)*	*Takeoff*	*Taxi*	*Hold (initial)*	*Hold (last 2-min)*	*Takeoff*
Average	39,954	215,679	546,740	538,856	39,923	119,771	315,746	495,992
Median	40,910	121,155	446,900	275,495	24,474	118,635	305,745	230,346
5th %	6,789	3,477	210,552	23,844	8,476	16,069	6,542	74,368
95th %	67,147	630,016	1,081,750	1,750,778	117,348	224,268	567,121	1,477,074
Min	4,531	3,108	196,270	11,986	6,683	4,673	5,153	57,773
Max	67,848	794,060	1,402,850	2,595,020	186,250	236,005	577,973	1,815,330
Stdev	21,286	253,740	335,108	722,844	48,833	115,670	203,135	559,751
Valid N	13	10	14	13	12	3	13	10

Figure 7 Aerial view of SMO showing the location of the two run-up areas near runway 21 with respect to the East Tarmac monitoring station



Volatile Organic Compounds at the East Tarmac Station

A total of nine canister samples (collected automatically when the measured NMHC and/or Methane levels were higher than 3 and 5 ppm, respectively) were taken at the East Tarmac MMS during and after the repaving project. All of these samples were analyzed for more than 60 of the hydrocarbons typically monitored by AQMD at Photochemical Assessment Monitoring Station (PAMS) sites. Three of these samples were also analyzed for a series of additional VOC, selected because of their potential importance relative to toxic cancer risk in the South Coast Air Basin (Table 7). It should be noted that "PAMS hydrocarbons" and "Toxic VOC" were measured using two different analytical procedures and some of the volatile species categorized as "PAMS hydrocarbons" were also reported in the "Toxic VOC" list (i.e. benzene, ethylbenzene, m,p-xylene, o-xylene, pentane, styrene and toluene; highlighted in yellow in Table 7).

As shown in Figures 8a, the canister samples collected during the repaving project (when no aircraft activity was occurring) where characterized by increased acetylene, ethane and, to a lesser extent, ethylene concentrations. These elevated VOC are not considered air toxic chemicals, and other VOC detected in these samples were close to typical South Coast Air Basin levels. These VOC are often used as tracers for gasoline exhaust in the urban atmosphere, and they are probably associated with increased motor-vehicle traffic due to repaving activities on the runway and within the restricted work area. However, the relative contributions of these and other pollution sources (e.g. local surface streets) to the measured VOC levels cannot be assessed from the available data. Interestingly, all four canister samples collected between 09/21/10 and 09/24/10 were taken late in the afternoon or at night (Figure 8a).

After the reopening of SMO, the concentrations of all measured "PAMS hydrocarbons" and "Toxic VOC" were similar to those observed in other parts of the South Coast Basin away from the immediate influence of any specific mobile sources. However, unusually high levels of pentane were observed in canister samples collected after 09/24/10 (Figures 8b and c). It is possible that this solvent component was used

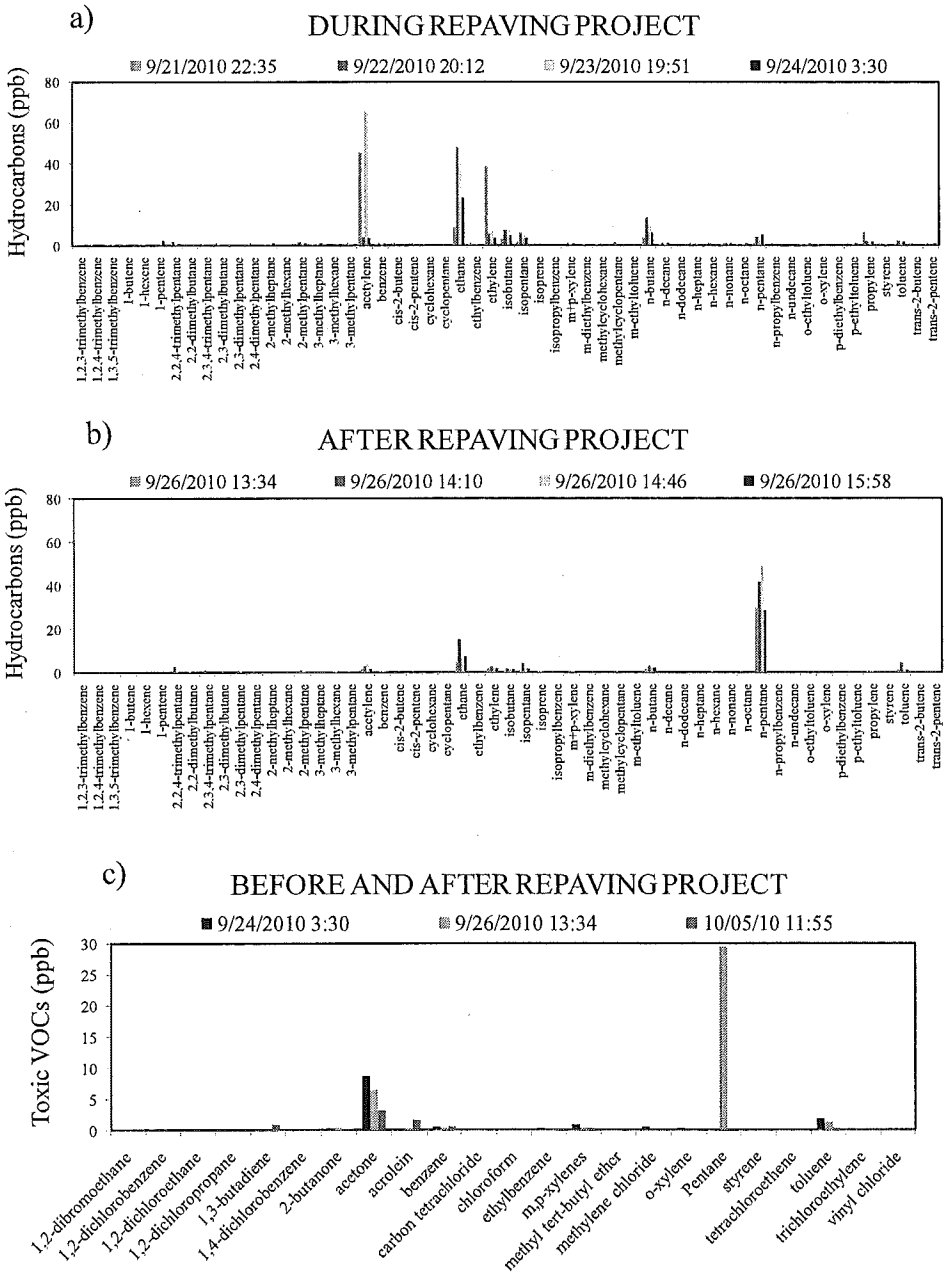
during the Phase III of the pavement rejuvenation project (construction outside the runway area was completed between 09/25/10 and 10/05/10; Table 1) and/or stored along with other solvents and construction material in the parking area located about 15 m north of the East Tarmac station. Note that pentane is not considered an air toxic chemical.

The October 5th sample contained a detectable amount of acrolein. While this is an air toxic that has been associated with jet exhaust, the level detected in this sample was not unusual for the South Coast Basin. Also note that there have been recent technical issues regarding the accuracy of the current U.S. EPA-approved methods for acrolein measurements, and the AQMD is working with U.S. EPA to resolve the issues. Therefore, this acrolein level remains unverified given the current method limitations.

Table 7 List of volatile organic compounds (VOC) analyzed on the canister samples collected at SMO during and after the repaving project. Only three of the eight collected samples were analyzed for all of the VOC listed below. The species highlighted in yellow are present as part of both the "PAMS HYDROCARBONS" and "Toxic VOC" list

PAMS HYDROCARBONS		
1,2,3-trimethylbenzene	cis-2-butene	n-hexane
1,2,4-trimethylbenzene	cis-2-pentene	n-nonane
1,3,5-trimethylbenzene	Cyclohexane	n-octane
1-butene	Cyclopentane	n-pentane
1-hexene	Ethane	n-propylbenzene
1-pentene	Ethylbenzene	n-undecane
2,2,4-trimethylpentane	Ethylene	o-ethyltoluene
2,2-dimethylbutane	Isobutene	o-xylene
2,3,4-trimethylpentane	Isopentane	p-diethylbenzene
2,3-dimethylbutane	Isoprene	p-ethyltoluene
2,3-dimethylpentane	isopropylbenzene	propylene
2,4-dimethylpentane	m,p-xylene	styrene
2-methylheptane	m-diethylbenzene	toluene
2-methylhexane	methylcyclohexane	trans-2-butene
2-methylpentane	methylcyclopentane	trans-2-pentene
3-methylheptane	m-ethyltoluene	
3-methylhexane	n-butane	
3-methylpentane	n-decane	
acetylene	n-dodecane	
benzene	n-heptane	
TOXIC VOC		
1,2-dibromoethane	carbon tetrachloride	tetrachloroethene
1,2-dichlorobenzene	Chloroform	toluene
1,2-dichloroethane	Ethylbenzene	trichloroethylene
1,2-dichloropropane	m,p-xylenes	vinyl chloride
1,3-butadiene	methyl tert-butyl ether	
1,4-dichlorobenzene	methylene chloride	
2-butanone	o-xylene	
acetone	Pentane	
acrolein	Propane	
benzene	Styrene	

Figure 8 "PAMS HYDROCARBONS" analyzed on eight canister samples collected at the East Tarmac Mobile Measurement Station (MMS) a) during and b) after the repaving project. Three of these samples were also analyzed for several "TOXIC VOC" (c)



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APPENDIX B: Traffic Activity Data

Table B Santa Monica Airport (SMO) traffic activity data from 09/12/10 and 10/03/10. The airport remained close from 09/19/10 to 09/24/10 due to a "Pavement Rehabilitation Project". The letters "J" and "T" designate Jet and Turboprop aircraft, respectively

Aircraft No.	Aircraft Model / Type	Aircraft Weight	Date	Taxi Begins (a)	Hold Begins (b)	Departure Time (c)	Total Taxi (b-a)	Total Hold (c-b)	Grand Total (c-a)
321LH	PA42 / T	10,330	9/12/2010	7:38:00	7:40:00	7:43:00	0:02:00	0:03:00	0:05:00
332FX	CL60 / J	36,000	9/12/2010	9:01:00	9:03:00	9:06:00	0:02:00	0:03:00	0:05:00
904FL	E135 / J	40,785	9/12/2010	9:05:00	9:07:00	9:15:00	0:02:00	0:08:00	0:10:00
748QS	GALX / J	35,000	9/12/2010	9:19:00	9:21:00	9:27:00	0:02:00	0:06:00	0:08:00
428CS	C525 / J	9,800	9/12/2010	9:37:00	9:39:00	9:48:00	0:02:00	0:09:00	0:11:00
425KD	C425 / T	8,000	9/12/2010	11:48:00	11:49:00	12:05:00	0:01:00	0:16:00	0:17:00
646QS*	C560 / J	15,200	9/12/2010	12:57:14	12:59:41	13:00:38	0:02:27	0:00:57	0:03:24
441FX	LJ45 / J	19,200	9/12/2010	13:11:07	13:12:44	13:17:31	0:01:37	0:04:47	0:06:24
969WR	G150 / J	26,250	9/12/2010	13:36:51	13:39:17	13:56:29	0:02:26	0:17:12	0:19:38
697QS	C560 / J	15,200	9/12/2010	13:40:39	13:42:42	13:59:32	0:02:03	0:16:50	0:18:53
707AV	TBM700 / T	6,614	9/12/2010	14:55:05	14:57:29	14:57:48	0:02:24	0:00:19	0:02:43
64LG	MU-2B-25 / T	8,490	9/12/2010	14:59:28	15:01:35	15:02:42	0:02:07	0:01:07	0:03:14
618FX	LJ45 / J	19,200	9/12/2010	15:19:09	15:21:01	15:27:03	0:01:52	0:06:02	0:07:54
208BH	LJ60 / J	19,500	9/12/2010	15:25:05	15:26:12	15:32:42	0:01:07	0:06:30	0:07:37
308MJ	EMB-505 / J	18,100	9/12/2010	16:00:13	16:02:28	16:03:42	0:02:15	0:01:14	0:03:29
417C	C525 / J	9,800	9/12/2010	16:40:48	16:41:39	16:42:20	0:00:51	0:00:41	0:01:32
821QS	H800XP / J	21,200	9/12/2010	16:47:55	16:49:53	16:51:18	0:01:58	0:01:25	0:03:23
300TN	B300 / T	14,000	9/12/2010	17:05:42	17:06:53	17:07:01	0:01:11	0:00:08	0:01:19
532FX	CL30 / J	33,750	9/13/2010	7:29:30	7:31:30	7:44:55	0:02:00	0:13:25	0:15:25
122BX	LJ31 / J	15,300	9/13/2010	7:32:15	7:35:00	7:59:50	0:02:45	0:24:50	0:27:35
315QS	C680 / J	27,100	9/13/2010	9:15:25	9:20:30	9:22:45	0:05:05	0:02:15	0:07:20
646QS	C560 / J	15,200	9/13/2010	9:30:45	9:34:15	9:38:58	0:03:30	0:04:43	0:08:13
124PS	PC12 / J	9,039	9/13/2010	10:24:45	10:26:55	10:35:45	0:02:10	0:08:50	0:11:00
612FX	LJ45 / J	19,200	9/13/2010	10:58:30	11:01:10	11:05:15	0:02:40	0:04:05	0:06:45
557TC	EMB-500 / J	10,500	9/13/2010	11:16:15	11:18:55	11:19:55	0:02:40	0:01:00	0:03:40
448LX	BE40 / J	16,300	9/13/2010	13:14:29	13:18:29	13:19:50	0:04:00	0:01:21	0:05:21
700R	H800XP / J	21,200	9/13/2010	14:21:06	14:24:53	14:26:27	0:03:47	0:01:34	0:05:21
566QS	C560 / J	15,200	9/13/2010	14:59:28	15:02:50	15:06:45	0:03:22	0:03:55	0:07:17
307SH	C510 / J	8,730	9/13/2010	16:05:58	16:13:16	16:18:50	0:07:18	0:05:34	0:12:52
708GP	C525 / J	9,800	9/13/2010	16:50:05	16:53:45	16:55:32	0:03:40	0:01:47	0:05:27
610FX	LJ45 / J	19,200	9/13/2010	16:58:55	17:00:48	17:02:14	0:01:53	0:01:26	0:03:19
616QS	C560 / J	15,200	9/13/2010	17:35:50	17:38:17	17:42:31	0:02:27	0:04:14	0:06:41
550GL	B200 / T	12,500	9/13/2010	18:05:25	18:08:58	18:10:41	0:03:33	0:01:43	0:05:16
943QS	C750 / J	31,800	9/13/2010	18:17:55	18:20:37	18:21:23	0:02:42	0:00:46	0:03:28
805C	B200 / T	12,500	9/13/2010	18:43:11	18:46:32	18:46:43	0:03:21	0:00:11	0:03:32
560MR	C560 / J	15,200	9/14/2010	6:09:35	6:13:19	6:15:40	0:03:44	0:02:21	0:06:05
750LG	CL60 / J	36,000	9/14/2010	6:18:06	6:20:10	6:24:01	0:02:04	0:03:51	0:05:55
224MD	EMB-500 / J	10,500	9/14/2010	6:42:51	6:46:23	6:49:45	0:03:32	0:03:22	0:06:54
311AF	S550 / J	11,000	9/14/2010	6:52:45	6:54:25	7:03:40	0:01:40	0:09:15	0:10:55
522FX	CL30 / J	33,750	9/14/2010	7:04:09	7:07:17	7:19:19	0:03:08	0:12:02	0:15:10
417Q	C525 / J	9,800	9/14/2010	7:04:33	7:07:20	7:20:24	0:02:47	0:13:04	0:15:51
321GL	LJ31 / J	15,300	9/14/2010	7:15:19	7:17:49	7:21:49	0:02:30	0:04:00	0:06:30
650LG	CL60 / J	36,000	9/14/2010	7:36:42	7:40:01	7:41:16	0:03:19	0:01:15	0:04:34
307SH	C510 / J	8,730	9/14/2010	9:35:51	9:40:15	9:44:24	0:04:24	0:04:09	0:08:33
969WR	G150 / J	26,250	9/14/2010	9:45:53	9:51:51	9:55:46	0:05:58	0:03:55	0:09:53
168DJ	FA20 / J	26,000	9/14/2010	11:11:29	11:15:59	11:18:16	0:04:30	0:02:17	0:06:47
667QS	C560 / J	15,200	9/14/2010	11:22:51	11:26:23	11:39:37	0:03:32	0:13:14	0:16:46
7208N	EPIC LT / T	NA	9/14/2010	12:32:15	12:35:20	12:36:55	0:03:05	0:01:35	0:04:40
904PA	BE90 / T	9,168	9/14/2010	12:49:33	12:55:25	12:59:40	0:05:52	0:04:15	0:10:07
104HW	C550 / J	12,700	9/14/2010	12:57:05	12:58:40	12:59:43	0:01:35	0:01:03	0:02:38
877SD	C550 / J	12,700	9/14/2010	13:22:24	13:24:33	13:24:54	0:02:09	0:00:21	0:02:30
194SJ	C525 / J	9,800	9/14/2010	13:36:47	13:39:35	13:40:10	0:02:48	0:00:35	0:03:23
752MT	H800XP / J	21,200	9/14/2010	14:07:04	14:09:44	14:20:31	0:02:40	0:10:47	0:13:27
292CS	C680 / J	27,100	9/14/2010	14:07:46	14:10:05	14:22:30	0:02:19	0:12:25	0:14:44
510HS	C510 / J	8,730	9/14/2010	14:42:11	14:44:50	14:45:36	0:02:39	0:00:46	0:03:25
213GS	CL60 / J	36,000	9/14/2010	14:54:03	14:56:47	14:57:49	0:02:44	0:01:02	0:03:46
525NB	C525 / J	9,800	9/14/2010	14:59:45	15:02:21	15:06:45	0:02:36	0:04:24	0:07:00

Aircraft No.	Aircraft Model / Type	Aircraft Weight	Date	Taxi Begins (a)	Hold Begins (b)	Departure Time (c)	Total Taxi (b-a)	Total Hold (c-b)	Grand Total (c-a)
904PA	BE90 / T	9,168	9/14/2010	16:10:56	16:13:12	16:13:45	0:02:16	0:00:33	0:02:49
74PT	LJ45 / J	19,200	9/14/2010	16:18:28	16:20:36	16:24:07	0:02:08	0:03:31	0:05:39
90RT	BE90 / T	9,168	9/14/2010	16:19:53	16:23:40	16:25:01	0:03:47	0:01:21	0:05:08
25FS	C550 / J	12,700	9/14/2010	16:37:05	16:38:50	16:39:20	0:01:45	0:00:30	0:02:15
969WR	G150 / J	26,250	9/14/2010	16:41:09	16:43:23	16:43:51	0:02:14	0:00:28	0:02:42
4YS	B300 / T	14,000	9/14/2010	16:42:30	16:44:44	16:45:23	0:02:14	0:00:39	0:02:53
125BP	PC12 / T	9,039	9/14/2010	16:46:01	16:47:35	16:47:43	0:01:34	0:00:08	0:01:42
708GP	C525 / J	9,800	9/14/2010	17:16:07	17:18:15	17:18:54	0:02:08	0:00:39	0:02:47
612FX	LJ45 / J	19,200	9/14/2010	18:14:52	18:18:06	18:19:27	0:03:14	0:01:21	0:04:35
5NG	GLF4 / J	58,500	9/15/2010	6:13:19	6:17:01	6:17:59	0:03:42	0:00:58	0:04:40
9NG	C750 / J	31,800	9/15/2010	6:16:18	6:19:21	6:22:55	0:03:03	0:03:34	0:06:37
22NG	C750 / J	31,800	9/15/2010	6:28:04	6:32:07	6:33:31	0:04:03	0:01:24	0:05:27
888WG	PC12 / T	9,039	9/15/2010	10:01:32	10:03:21	10:05:59	0:01:49	0:02:38	0:04:27
1871R	C560 / J	15,200	9/15/2010	10:03:40	10:05:56	10:06:57	0:02:16	0:01:01	0:03:17
542FX	CL30 / J	33,750	9/15/2010	12:16:49	12:20:32	12:23:14	0:03:43	0:02:42	0:06:25
816CS	C560 / J	15,200	9/15/2010	12:27:02	12:29:55	12:34:55	0:02:53	0:05:00	0:07:53
778TC	EA500 / J	5,800	9/15/2010	13:03:25	13:05:19	13:06:06	0:01:54	0:00:47	0:02:41
510GG	C510 / J	8,730	9/15/2010	13:51:15	13:54:19	13:54:53	0:03:04	0:00:34	0:03:38
574BP	C560 / J	15,200	9/15/2010	14:15:13	14:18:36	14:22:20	0:03:23	0:03:44	0:07:07
10XQ	G200 / J	30,000	9/15/2010	15:05:16	15:07:20	15:12:00	0:02:04	0:04:40	0:06:44
297MC	CL30 / J	33,750	9/15/2010	15:41:09	15:43:45	15:48:24	0:02:36	0:04:39	0:07:15
916GR	G200 / J	30,000	9/15/2010	15:56:52	15:58:44	16:03:34	0:01:52	0:04:50	0:06:42
311AF	S550 / J	11,000	9/15/2010	16:15:00	16:16:39	16:17:26	0:01:39	0:00:47	0:02:26
260DP	SF260 / T	NA	9/15/2010	16:17:00	16:18:20	16:20:15	0:01:20	0:01:55	0:03:15
151KV	C560 / J	15,200	9/15/2010	16:22:40	16:25:08	16:27:48	0:02:28	0:02:40	0:05:08
942TW	PC12 / T	9,039	9/15/2010	16:55:57	16:57:13	16:57:35	0:01:16	0:00:22	0:01:38
708GP	C525 / J	9,800	9/15/2010	16:58:00	17:00:18	17:10:58	0:02:18	0:10:40	0:12:58
574BP	C560 / J	15,200	9/15/2010	18:25:13	18:27:39	18:30:30	0:02:26	0:02:51	0:05:17
700NW	HS 125-700A / J	21,200	9/16/2010	8:56:45	8:58:15	9:00:41	0:01:30	0:02:26	0:03:56
350BV	C525 / J	9,800	9/16/2010	8:57:01	8:59:52	9:02:55	0:02:51	0:03:03	0:05:54
338FX	CL60 / J	36,000	9/16/2010	9:10:52	9:14:00	9:15:16	0:03:08	0:01:16	0:04:24
298AG	E 125 SERIES 800/	27,500	9/16/2010	9:20:00	9:23:10	9:24:50	0:03:10	0:01:40	0:04:50
442FL	BE40 / J	16,300	9/16/2010	9:30:57	9:34:26	9:35:55	0:03:29	0:01:29	0:04:58
842QS	H800XP / J	21,200	9/16/2010	9:37:32	9:40:41	9:43:09	0:03:09	0:02:28	0:05:37
224MD	EMB-500 / J	10,500	9/16/2010	9:54:11	9:57:38	9:58:39	0:03:27	0:01:01	0:04:28
722SR	TBM700 / T	6,614	9/16/2010	11:26:09	11:28:32	11:30:45	0:02:23	0:02:13	0:04:36
25LZ	C525 / J	9,800	9/16/2010	11:28:39	11:31:47	11:33:54	0:03:08	0:02:07	0:05:15
702DR	E135 / J	40,785	9/16/2010	11:37:45	11:39:15	11:49:30	0:01:30	0:10:15	0:11:45
877SD	C550 / J	12,700	9/16/2010	12:19:02	12:20:51	12:28:45	0:01:49	0:07:54	0:09:43
354EF	LJ35 / J	15,300	9/16/2010	12:22:32	12:26:10	12:30:50	0:03:38	0:04:40	0:08:18
456TM	BE40 / J	16,300	9/17/2010	8:11:47	8:13:48	8:17:44	0:02:01	0:03:56	0:05:57
814TB	PC12 / T	9,039	9/17/2010	8:12:46	8:14:16	8:19:12	0:01:30	0:04:56	0:06:26
679QS	C560 / J	15,200	9/17/2010	8:56:12	8:58:48	8:59:20	0:02:36	0:00:32	0:03:08
165BC	690C / T	10,375	9/17/2010	9:09:08	9:11:13	9:14:37	0:02:05	0:03:24	0:05:29
123GF	C550 / J	12,700	9/17/2010	9:17:52	9:20:36	9:21:20	0:02:44	0:00:44	0:03:28
316AM	B200 / T	12,500	9/17/2010	10:10:38	10:12:26	10:14:49	0:01:48	0:02:23	0:04:11
523FX	CL30 / J	33,750	9/17/2010	10:41:30	10:43:17	10:47:02	0:01:47	0:03:45	0:05:32
510GG	C510 / J	8,730	9/17/2010	11:07:52	11:10:49	11:15:09	0:02:57	0:04:20	0:07:17
808QS	C560 / J	15,200	9/17/2010	11:25:04	11:27:51	11:28:15	0:02:47	0:00:24	0:03:11
188PC	PC12 / T	9,039	9/17/2010	13:01:04	13:03:59	13:07:06	0:02:55	0:03:07	0:06:02
83KA	B200 / T	12,500	9/17/2010	13:16:38	13:18:23	13:20:48	0:01:45	0:02:25	0:04:10
303CP	C560 / J	15,200	9/17/2010	13:18:13	13:21:59	13:30:02	0:03:46	0:08:03	0:11:49
93SF	B100 / T	11,875	9/17/2010	13:37:22	13:41:10	13:43:10	0:03:48	0:02:00	0:05:48
35ET	C550 / J	12,700	9/17/2010	14:10:37	14:13:24	14:14:14	0:02:47	0:00:50	0:03:37
219L	C525 / J	9,800	9/17/2010	14:21:18	14:22:37	14:33:13	0:01:19	0:10:36	0:11:55
646QS	C560 / J	15,200	9/17/2010	15:09:55	15:12:31	15:18:02	0:02:36	0:05:31	0:08:07
554MB	C550 / J	12,700	9/17/2010	15:26:16	15:30:03	15:37:50	0:03:47	0:07:47	0:11:34

Aircraft No.	Aircraft Model / Type	Aircraft Weight	Date	Taxi Begins (a)	Hold Begins (b)	Departure Time (c)	Total Taxi (b-a)	Total Hold (c-b)	Grand Total (c-a)
634QS	C560 / J	15,200	9/17/2010	15:37:25	15:40:32	15:51:10	0:03:07	0:10:38	0:13:45
722SR	TBM700 / T	6,614	9/17/2010	16:07:37	16:09:03	16:15:20	0:01:26	0:06:17	0:07:43
461QS	GLF4 / J	58,500	9/17/2010	16:22:13	16:25:32	16:31:09	0:03:19	0:05:37	0:08:56
573G	SA227-AT / T	14,000	9/17/2010	16:39:20	16:41:15	16:56:51	0:01:55	0:15:36	0:17:31
816CS	C560 / J	15,200	9/17/2010	17:09:25	17:12:02	17:17:55	0:02:37	0:05:53	0:08:30
904DJ	BE90 / T	9,168	9/17/2010	17:12:36	17:14:36	17:20:16	0:02:00	0:05:40	0:07:40
187EA	EA500 / J	5,800	9/17/2010	17:16:04	17:18:24	17:27:02	0:02:20	0:08:38	0:10:58
247CH	BE90 / T	9,168	9/17/2010	17:16:55	17:18:38	17:35:25	0:01:43	0:16:47	0:18:30
533FX	CL30 / J	33,750	9/17/2010	17:32:50	17:36:08	17:42:57	0:03:18	0:06:49	0:10:07
525LM	C525 / J	9,800	9/18/2010	7:17:17	7:19:58	7:25:26	0:02:41	0:05:28	0:08:09
224MD	EMB-500 / J	10,500	9/18/2010	8:34:21	8:36:18	8:39:55	0:01:57	0:03:37	0:05:34
850CA	TBM700 / T	6,614	9/18/2010	11:20:00	11:22:47	11:27:11	0:02:47	0:04:24	0:07:11
816CS	C560 / J	15,200	9/18/2010	12:45:55	12:47:22	12:52:37	0:01:27	0:05:15	0:06:42
961QS	C750 / J	31,800	9/18/2010	13:50:37	13:52:31	13:54:21	0:01:54	0:01:50	0:03:44
417C	C525 / J	9,800	9/18/2010	14:10:32	14:12:40	14:14:51	0:02:08	0:02:11	0:04:19
247CH	BE90 / T	9,168	9/18/2010	14:14:14	14:15:52	14:22:09	0:01:38	0:06:17	0:07:55
610FX	LJ45 / J	19,200	9/18/2010	14:22:44	14:25:01	14:26:57	0:02:17	0:01:56	0:04:13
7UF	GLF4 / J	58,500	9/18/2010	15:37:08	15:38:55	15:41:03	0:01:47	0:02:08	0:03:55
843QS	C560 / J	15,200	9/18/2010	16:12:04	16:12:04	16:13:20	0:00:00	0:01:16	0:01:16
108QS	C560 / J	15,200	9/18/2010	18:05:40	18:05:40	18:11:05	0:00:00	0:05:25	0:05:25
568TT	B200 / T	12,500	9/19/2010	7:26:31	7:28:29	7:29:27	0:01:58	0:00:58	0:02:56
253QS	F2TH / J	33,000	9/19/2010	8:03:21	8:07:41	8:09:33	0:04:20	0:01:52	0:06:12
695GL	LJ45 / J	19,200	9/19/2010	9:16:41	9:20:01	9:20:53	0:03:20	0:00:52	0:04:12
722SR	TBM700 / T	6,614	9/19/2010	10:32:02	10:33:41	10:41:39	0:01:39	0:07:58	0:09:37
224MD	EMB-500 / J	10,500	9/19/2010	11:25:33	11:27:29	11:28:14	0:01:56	0:00:45	0:02:41
360HS	C560 / J	15,200	9/19/2010	12:02:50	12:05:31	12:10:47	0:02:41	0:05:16	0:07:57
829QS	C560 / J	15,200	9/19/2010	12:43:49	12:47:03	12:53:05	0:03:14	0:06:02	0:09:16
421LT	C560 / J	15,200	9/19/2010	13:14:14	13:17:11	13:27:21	0:02:57	0:10:10	0:13:07
100WP	C560 / J	15,200	9/19/2010	13:27:29	13:29:45	13:33:37	0:02:16	0:03:52	0:06:08
739LN	C525 / J	9,800	9/19/2010	13:58:00	14:00:41	14:03:35	0:02:41	0:02:54	0:05:35
188PC	PC12 / T	9,039	9/19/2010	14:11:23	14:13:18	14:13:47	0:01:55	0:00:29	0:02:24
739QS	G200 / J	30,000	9/19/2010	14:46:39	14:49:23	14:50:06	0:02:44	0:00:43	0:03:27
403QS	GLF4 / J	58,500	9/19/2010	15:06:17	15:09:03	15:15:57	0:02:46	0:06:54	0:09:40
664QS	C560 / J	15,200	9/19/2010	15:18:29	15:20:38	15:31:37	0:02:09	0:10:59	0:13:08
123GF	C550 / J	12,700	9/19/2010	16:46:53	16:48:34	16:49:32	0:01:41	0:00:58	0:02:39
316AM	B200 / T	12,500	9/19/2010	16:58:31	17:01:47	17:02:40	0:03:16	0:00:53	0:04:09
323QS	C680 / J	27,100	9/19/2010	17:19:05	17:21:24	17:27:08	0:02:19	0:05:44	0:08:03
83KA	B200 / T	12,500	9/19/2010	18:13:08	18:14:57	18:16:57	0:01:49	0:02:00	0:03:49
778TC	EA500 / J	5,800	9/24/2010	8:46:40	8:49:26	8:54:45	0:02:46	0:05:19	0:08:05
165BC	690C / T	10,375	9/24/2010	9:55:44	9:57:45	9:58:59	0:02:01	0:01:14	0:03:15
46FD	PA42 / T	10,330	9/24/2010	12:11:41	12:13:41	12:21:25	0:02:00	0:07:44	0:09:44
999VK	CL60 / J	36,000	9/24/2010	13:22:15	13:26:41	13:39:01	0:04:26	0:12:20	0:16:46
207DB	B200 / T	12,500	9/24/2010	13:34:22	13:38:27	13:40:06	0:04:05	0:01:39	0:05:44
525LM	C525 / J	9,800	9/24/2010	14:09:44	14:12:57	14:18:35	0:03:13	0:05:38	0:08:51
711SW	GLF4 / J	58,500	9/24/2010	14:26:43	14:29:01	14:37:52	0:02:18	0:08:51	0:11:09
542CS	C560 / J	15,200	9/24/2010	16:09:36	16:13:10	16:19:02	0:03:34	0:05:52	0:09:26
123AC	LJ45 / J	19,200	9/24/2010	16:37:43	16:41:38	16:44:03	0:03:55	0:02:25	0:06:20
644SD	PC12 / T	9,039	9/24/2010	16:46:31	16:47:51	16:53:35	0:01:20	0:05:44	0:07:04
550LG	CL60 / J	36,000	9/24/2010	17:03:15	17:05:01	17:08:45	0:01:46	0:03:44	0:05:30
904FL	E135 / J	40,785	9/24/2010	17:24:50	17:33:12	17:33:58	0:08:22	0:00:46	0:09:08
888MN	PRM1 / T	12,590	9/24/2010	18:08:23	18:10:25	18:16:06	0:02:02	0:05:41	0:07:43
242NA	B200 / T	12,500	9/24/2010	19:03:09	19:05:37	19:06:49	0:02:28	0:01:12	0:03:40
53PE	C560 / J	15,200	9/25/2010	8:01:17	8:04:20	8:08:38	0:03:03	0:04:18	0:07:21
812GJ	H25B / J	27,520	9/25/2010	8:50:27	8:53:38	8:56:07	0:03:11	0:02:29	0:05:40
224MD	EMB500 / J	10,500	9/25/2010	9:52:39	9:54:19	10:01:12	0:01:40	0:06:53	0:08:33
311AF	C550 / J	12,700	9/25/2010	10:44:52	10:47:01	10:54:11	0:02:09	0:07:10	0:09:19
405TM	H800XP / J	21,200	9/25/2010	12:25:30	12:27:48	12:35:14	0:02:18	0:07:26	0:09:44

Aircraft No.	Aircraft Model / Type	Aircraft Weight	Date	Taxi Begins (a)	Hold Begins (b)	Departure Time (c)	Total Taxi (b-a)	Total Hold (c-b)	Grand Total (c-a)
242NA	B200 / T	12,500	9/25/2010	13:22:51	13:24:14	13:25:11	0:01:23	0:00:57	0:02:20
311AF	C550 / J	12,700	9/25/2010	15:04:53	15:06:46	15:09:54	0:01:53	0:03:08	0:05:01
1776C	H25B / J	28,120	9/25/2010	15:32:05	15:32:05	15:34:07	0:00:00	0:02:02	0:02:02
620FX	LJ45 / J	19,200	9/26/2010	9:53:01	9:54:28	10:12:22	0:01:27	0:17:54	0:19:21
357QS	C680 / J	27,100	9/26/2010	10:56:10	10:57:55	11:01:11	0:01:45	0:03:16	0:05:01
278SW	BE90 / T	9,168	9/26/2010	13:07:07	13:08:42	13:14:55	0:01:35	0:06:13	0:07:48
707SG	G200 / J	30,000	9/26/2010	13:22:20	13:24:20	13:25:59	0:02:00	0:01:39	0:03:39
894C	C525 / J	9,800	9/26/2010	13:22:35	13:24:33	13:35:22	0:01:58	0:10:49	0:12:47
925FL	E135 / J	40,785	9/26/2010	13:23:18	13:25:02	13:38:56	0:01:44	0:13:54	0:15:38
732LH	LJ60 / J	19,500	9/26/2010	13:29:11	13:37:29	13:42:53	0:08:18	0:05:24	0:13:42
101AR	B400 / J	15,100	9/26/2010	13:40:42	13:42:57	13:47:58	0:02:15	0:05:01	0:07:16
468LX	B400 / J	15,100	9/26/2010	14:29:55	14:32:21	14:39:58	0:02:26	0:07:37	0:10:03
512TB	C525 / J	9,800	9/26/2010	15:06:16	15:10:28	15:11:15	0:04:12	0:00:47	0:04:59
387HA	LJ35 / J	15,300	9/26/2010	15:23:46	15:25:40	15:26:21	0:01:54	0:00:41	0:02:35
711SW	GLF4 / J	58,500	9/26/2010	18:18:48	18:20:04	18:22:41	0:01:16	0:02:37	0:03:53
732LH	LJ60 / J	19,500	9/26/2010	19:39:48	19:41:19	19:42:19	0:01:31	0:01:00	0:02:31
311AF	C550 / J	12,700	9/27/2010	6:16:33	6:19:20	6:20:08	0:02:47	0:00:48	0:03:35
525LM	C525 / J	9,800	9/27/2010	6:39:22	6:42:07	6:44:15	0:02:45	0:02:08	0:04:53
360DA	PC12 / T	9,039	9/27/2010	7:21:42	7:23:15	7:24:20	0:01:33	0:01:05	0:02:38
421LT	C560 / J	15,200	9/27/2010	8:02:59	8:08:05	8:09:59	0:05:06	0:01:54	0:07:00
462LX	BE40 / J	16,300	9/27/2010	8:07:42	8:10:22	8:11:17	0:02:40	0:00:55	0:03:35
699QS	C560 / J	15,200	9/27/2010	8:59:01	9:01:24	9:04:50	0:02:23	0:03:26	0:05:49
427CS	C525 / J	9,800	9/27/2010	9:08:28	9:11:38	9:15:00	0:03:10	0:03:22	0:06:32
888QS	H900-XP / J	28,120	9/27/2010	9:09:59	9:12:42	9:16:30	0:02:43	0:03:48	0:06:31
154SC	C501 / J	12,000	9/27/2010	9:28:00	9:30:09	9:35:22	0:02:09	0:05:13	0:07:22
643QS	C560 / J	15,200	9/27/2010	9:52:08	9:54:12	9:55:02	0:02:04	0:00:50	0:02:54
165BC	690C / J	10,375	9/27/2010	9:55:59	9:57:30	10:01:17	0:01:31	0:03:47	0:05:18
542FX	CL30 / J	33,750	9/27/2010	11:05:09	11:08:36	11:10:16	0:03:27	0:01:40	0:05:07
812LX	H800XP / J	21,200	9/27/2010	11:15:35	11:18:46	11:24:23	0:03:11	0:05:37	0:08:48
594M	C560 / J	15,200	9/27/2010	12:35:02	12:39:07	12:47:39	0:04:05	0:08:32	0:12:37
909PM	F900 / J	42,000	9/27/2010	13:15:43	13:18:52	13:20:14	0:03:09	0:01:22	0:04:31
888MN	PRM1 / J	12,590	9/27/2010	16:29:08	16:31:59	16:37:18	0:02:51	0:05:19	0:08:10
113BG	C525 / J	9,800	9/27/2010	17:05:33	17:07:51	17:09:31	0:02:18	0:01:40	0:03:58
708GP	C525 / J	9,800	9/27/2010	17:13:19	17:16:37	17:17:05	0:03:18	0:00:28	0:03:46
350WA	BE90 / T	9,168	9/27/2010	19:10:16	19:14:15	19:14:40	0:03:59	0:00:25	0:04:24
894C	C525 / J	9,800	9/28/2010	6:33:41	6:37:06	6:43:33	0:03:25	0:06:27	0:09:52
987QS	C750 / J	31,800	9/28/2010	6:52:24	6:55:03	6:59:04	0:02:39	0:04:01	0:06:40
904PA	BE90 / T	9,168	9/28/2010	6:56:38	6:57:53	6:58:01	0:01:15	0:00:08	0:01:23
888QS	H900XP / J	28,120	9/28/2010	7:28:26	7:31:55	7:33:49	0:03:29	0:01:54	0:05:23
151KV	C560 / J	15,200	9/28/2010	7:50:10	7:52:27	7:56:18	0:02:17	0:03:51	0:06:08
414TR	F2TH / J	33,000	9/28/2010	10:50:46	10:53:56	10:57:37	0:03:10	0:03:41	0:06:51
713FL	C750 / J	31,800	9/28/2010	11:02:51	11:07:01	11:09:02	0:04:10	0:02:01	0:06:11
818QS	C560 / J	15,200	9/28/2010	12:20:10	12:24:05	12:30:05	0:03:55	0:06:00	0:09:55
405QS	GLF4 / J	58,500	9/28/2010	13:26:08	13:29:12	13:31:18	0:03:04	0:02:06	0:05:10
529FD	TBM700 / T	6,614	9/28/2010	13:45:23	13:47:28	13:50:00	0:02:05	0:02:32	0:04:37
999JD	C510 / J	8,730	9/28/2010	14:05:32	14:07:44	14:13:29	0:02:12	0:05:45	0:07:57
151KV	C560 / J	15,200	9/28/2010	15:05:23	15:08:16	15:16:39	0:02:53	0:08:23	0:11:16
144AL	C525 / J	9,800	9/28/2010	15:39:53	15:42:43	15:47:22	0:02:50	0:04:39	0:07:29
417C	C525 / J	9,800	9/28/2010	15:53:23	15:55:07	16:01:02	0:01:44	0:05:55	0:07:39
7UF	GLF4 / J	58,500	9/28/2010	15:58:09	15:59:15	16:08:12	0:01:06	0:08:57	0:10:03
469MA	MU-2B-60 / T	9,970	9/28/2010	16:00:53	16:03:28	16:05:31	0:02:35	0:02:03	0:04:38
350TP	SF.260TP / T	NA	9/28/2010	16:06:07	16:09:22	16:11:54	0:03:15	0:02:32	0:05:47
419TM	BE40 / J	16,300	9/28/2010	16:31:31	16:34:16	16:35:26	0:02:45	0:01:10	0:03:55
904PA	BE90 / T	9,168	9/28/2010	16:45:10	16:46:29	16:46:54	0:01:19	0:00:25	0:01:44
708GP	C525 / J	9,800	9/28/2010	17:05:39	17:07:49	17:08:29	0:02:10	0:00:40	0:02:50
927LT	C680 / J	27,100	9/28/2010	17:08:23	17:11:19	17:16:56	0:02:56	0:05:37	0:08:33
888QS	H900-XP / J	28,120	9/28/2010	18:12:51	18:16:15	18:20:36	0:03:24	0:04:21	0:07:45

Aircraft No.	Aircraft Model / Type	Aircraft Weight	Date	Taxi Begins (a)	Hold Begins (b)	Departure Time (c)	Total Taxi (b-a)	Total Hold (c-b)	Grand Total (c-a)
N200VT	C550 / J	12,700	9/28/2010	18:48:37	18:50:30	18:58:29	0:01:53	0:07:59	0:09:52
N542FX	CL30 / J	33,750	9/28/2010	19:10:38	19:12:26	19:14:02	0:01:48	0:01:36	0:03:24
462LX	BE40 / J	16,300	9/29/2010	6:41:01	6:44:12	6:46:26	0:03:11	0:02:14	0:05:25
904PA	BE40 / J	16,300	9/29/2010	6:48:40	6:50:43	6:50:59	0:02:03	0:00:16	0:02:19
575JS	EMB500 / J	10,500	9/29/2010	7:46:25	7:49:40	7:58:19	0:03:15	0:08:39	0:11:54
700ER	TBM700 / T	6,614	9/29/2010	8:15:48	8:27:41	8:30:09	0:11:53	0:02:28	0:14:21
423SJ	H800XP / J	21,200	9/29/2010	8:47:39	8:49:52	8:51:25	0:02:13	0:01:33	0:03:46
722SR	TBM700 / T	6,614	9/29/2010	9:24:11	9:25:51	9:29:11	0:01:40	0:03:20	0:05:00
204PT	B200 / T	12,500	9/29/2010	9:36:10	9:37:44	9:41:34	0:01:34	0:03:50	0:05:24
308QS	C680 / J	27,100	9/29/2010	10:00:31	10:04:17	10:08:23	0:03:46	0:04:06	0:07:52
642JC	F900 / J	42,000	9/29/2010	10:47:13	10:51:14	10:52:30	0:04:01	0:01:16	0:05:17
350TP	SF.260TP / T	NA	9/29/2010	11:05:47	11:07:31	11:12:28	0:01:44	0:04:57	0:06:41
908QS	C750 / J	31,800	9/29/2010	11:17:48	11:20:27	11:25:12	0:02:39	0:04:45	0:07:24
952QS	C750 / J	31,800	9/29/2010	13:00:32	13:05:47	13:07:49	0:05:15	0:02:02	0:07:17
204PT	B200 / T	12,500	9/29/2010	13:01:52	13:05:52	13:12:09	0:04:00	0:06:17	0:10:17
700ER	TBM700 / T	6,614	9/29/2010	14:30:46	14:32:22	14:36:06	0:01:36	0:03:44	0:05:20
485FL	B400 / J	15,100	9/29/2010	15:32:07	15:35:44	15:37:47	0:03:37	0:02:03	0:05:40
XA-PVR	C525 / J	9,800	9/29/2010	16:11:10	16:15:24	16:24:42	0:04:14	0:09:18	0:13:32
151KV	C560 / J	15,200	9/29/2010	16:14:50	16:18:07	16:32:40	0:03:17	0:14:33	0:17:50
1BS	C750 / J	31,800	9/29/2010	16:21:08	16:23:13	16:36:57	0:02:05	0:13:44	0:15:49
904PA	BE90 / T	9,168	9/29/2010	16:31:49	16:33:26	16:33:44	0:01:37	0:00:18	0:01:55
708GP	C525 / J	9,800	9/29/2010	16:44:59	16:47:51	16:50:26	0:02:52	0:02:35	0:05:27
828QS	H800XP / J	21,200	9/29/2010	16:45:48	16:48:00	16:51:50	0:02:12	0:03:50	0:06:02
350BV	C525 / J	9,800	9/29/2010	17:09:18	17:10:34	17:10:43	0:01:16	0:00:09	0:01:25
423SJ	H25B / J	27,500	9/29/2010	17:46:07	17:48:57	17:53:32	0:02:50	0:04:35	0:07:25
241CW	B100 / T	11,875	9/29/2010	18:51:00	18:53:11	18:53:57	0:02:11	0:00:46	0:02:57
673DC	EMB500 / J	10,500	9/30/2010	6:29:14	6:30:49	6:31:44	0:01:35	0:00:55	0:02:30
575JS	EMB500 / J	10,500	9/30/2010	7:02:30	7:04:07	7:07:17	0:01:37	0:03:10	0:04:47
650LG	CL60 / J	36,000	9/30/2010	7:05:12	7:08:47	7:14:07	0:03:35	0:05:20	0:08:55
188PC	PC12 / T	9,039	9/30/2010	7:34:08	7:36:07	7:36:45	0:01:59	0:00:38	0:02:37
256FX	LJ60 / J	19,500	9/30/2010	8:12:12	8:14:59	8:15:42	0:02:47	0:00:43	0:03:30
888QS	H900-XP / J	28,120	9/30/2010	8:13:02	8:15:37	8:16:16	0:02:35	0:00:39	0:03:14
999YB	BE40 / J	16,300	9/30/2010	9:03:02	9:06:52	9:09:54	0:03:50	0:03:02	0:06:52
581JS	EMB500 / J	10,500	9/30/2010	9:18:31	9:20:23	9:20:43	0:01:52	0:00:20	0:02:12
134LJ	LJ31 / J	15,300	9/30/2010	10:10:44	10:12:39	10:13:37	0:01:55	0:00:58	0:02:53
311AF	C550 / J	12,700	9/30/2010	10:20:46	10:22:29	10:24:53	0:01:43	0:02:24	0:04:07
542BA	CL60 / J	36,000	9/30/2010	10:53:27	10:55:38	11:04:12	0:02:11	0:08:34	0:10:45
722SR	TBM700 / T	6,614	9/30/2010	11:31:00	11:32:05	11:42:30	0:01:05	0:10:25	0:11:30
608DC	ASTRA SPX / J	24,800	9/30/2010	11:34:25	11:36:34	11:41:31	0:02:09	0:04:57	0:07:06
420EH	C525 / J	9,800	9/30/2010	12:29:14	12:31:25	12:32:40	0:02:11	0:01:15	0:03:26
469MA	MU-2B-60 / T	9,970	9/30/2010	13:07:20	13:09:33	13:11:16	0:02:13	0:01:43	0:03:56
486QS	GLF4 / J	58,500	9/30/2010	13:09:36	13:12:01	13:15:13	0:02:25	0:03:12	0:05:37
575JS	EMB500 / J	10,500	9/30/2010	13:11:56	13:13:38	13:16:20	0:01:42	0:02:42	0:04:24
564RM	1124A / J	23,650	9/30/2010	13:17:52	13:21:06	13:21:34	0:03:14	0:00:28	0:03:42
188PC	PC12 / T	9,039	9/30/2010	13:19:21	13:21:57	13:22:28	0:02:36	0:00:31	0:03:07
417C	C525 / J	9,800	9/30/2010	13:33:14	13:35:09	13:37:31	0:01:55	0:02:22	0:04:17
54NW	LJ55 / J	18,000	9/30/2010	14:42:45	14:45:46	14:49:15	0:03:01	0:03:29	0:06:30
222MC	CL60 / J	36,000	9/30/2010	14:43:49	14:45:54	14:50:25	0:02:05	0:04:31	0:06:36
731PS	BE40 / J	16,300	9/30/2010	14:55:34	14:58:55	15:01:14	0:03:21	0:02:19	0:05:40
125BP	PC12 / T	9,039	9/30/2010	15:59:39	16:02:19	16:02:33	0:02:40	0:00:14	0:02:54
942TW	PC12 / T	9,039	9/30/2010	16:04:06	16:06:10	16:07:19	0:02:04	0:01:09	0:03:13
428LX	BE40 / J	16,300	9/30/2010	16:38:35	16:41:44	16:44:58	0:03:09	0:03:14	0:06:23
946QS	C750 / J	31,800	9/30/2010	17:08:17	17:11:23	17:16:29	0:03:06	0:05:06	0:08:12
312CC	LJ31 / J	15,300	9/30/2010	17:10:00	17:11:39	17:28:31	0:01:39	0:16:52	0:18:31
583QS	C560 / J	15,200	9/30/2010	18:28:20	18:34:36	18:40:13	0:06:16	0:05:37	0:11:53
599QS	C560 / J	15,200	9/30/2010	18:35:04	18:37:31	18:41:29	0:02:27	0:03:58	0:06:25
118MT	CL60 / J	36,000	9/30/2010	19:00:55	19:03:49	19:04:38	0:02:54	0:00:49	0:03:43

Aircraft No.	Aircraft Model / Type	Aircraft Weight	Date	Taxi Begins (a)	Hold Begins (b)	Departure Time (c)	Total Taxi (b-a)	Total Hold (c-b)	Grand Total (c-a)
288MB	H900XP / J	28,120	9/30/2010	19:33:57	19:36:01	19:36:50	0:02:04	0:00:49	0:02:53
904PA	BE90 / T	9,168	10/1/2010	6:09:15	6:10:03	6:10:28	0:00:48	0:00:25	0:01:13
821LX	H800XP / J	21,200	10/1/2010	7:06:15	7:08:46	7:12:48	0:02:31	0:04:02	0:06:33
904FL	E135 / J	40,785	10/1/2010	7:15:49	7:18:31	7:20:44	0:02:42	0:02:13	0:04:55
888QS	H900XP / J	28,120	10/1/2010	7:21:02	7:24:05	7:25:33	0:03:03	0:01:28	0:04:31
417Q	C525 / J	9,800	10/1/2010	8:05:12	8:09:56	8:10:14	0:04:44	0:00:18	0:05:02
642JL	B300 / T	14,000	10/1/2010	8:27:23	8:31:10	8:40:55	0:03:47	0:09:45	0:13:32
OY-LPU	C510 / J	8,730	10/1/2010	9:57:33	10:00:07	10:00:44	0:02:34	0:00:37	0:03:11
122QS	BE40 / J	16,300	10/1/2010	10:00:48	10:02:42	10:04:20	0:01:54	0:01:38	0:03:32
480QS	GLF4 / J	58,500	10/1/2010	10:21:09	10:25:31	10:28:21	0:04:22	0:02:50	0:07:12
852LX	H800XP / J	21,200	10/1/2010	10:44:59	10:47:31	10:48:13	0:02:32	0:00:42	0:03:14
819AP	G200 / J	30,000	10/1/2010	10:48:18	10:50:26	10:55:26	0:02:08	0:05:00	0:07:08
614BA	CL60 / J	36,000	10/1/2010	11:18:17	11:20:56	11:22:51	0:02:39	0:01:55	0:04:34
969WR	G150 / J	26,250	10/1/2010	11:25:38	11:28:05	11:36:47	0:02:27	0:08:42	0:11:09
409CS	C525 / J	9,800	10/1/2010	11:53:06	11:55:12	11:55:45	0:02:06	0:00:33	0:02:39
49CL	B300 / T	14,000	10/1/2010	11:57:18	11:59:04	12:43:09	0:01:46	0:44:05	0:45:51
802QS	C560 / J	15,200	10/1/2010	12:47:57	12:50:00	12:53:15	0:02:03	0:03:15	0:05:18
807SM	B200 / T	12,500	10/1/2010	12:48:12	12:50:15	12:54:19	0:02:03	0:04:04	0:06:07
814TB	PC12 / T	9,039	10/1/2010	12:53:11	12:55:04	12:59:49	0:01:53	0:04:45	0:06:38
510HS	C510 / J	8,730	10/1/2010	13:09:01	13:27:22	13:41:43	0:18:21	0:14:21	0:32:42
300TN	B300 / T	14,000	10/1/2010	13:19:54	13:25:10	13:25:19	0:05:16	0:00:09	0:05:25
830QS	C560 / J	15,200	10/1/2010	13:59:36	14:03:25	14:28:05	0:03:49	0:24:40	0:28:29
526FX	CL30 / J	33,750	10/1/2010	14:00:20	14:03:39	14:11:11	0:03:19	0:07:32	0:10:51
707AV	TBM700 / T	6,614	10/1/2010	14:15:47	14:17:18	14:22:57	0:01:31	0:05:39	0:07:10
56RJ	PC12 / T	9,039	10/1/2010	14:23:30	14:25:07	14:26:54	0:01:37	0:01:47	0:03:24
360DA	PC12 / T	9,039	10/1/2010	14:29:09	14:31:29	14:35:47	0:02:20	0:04:18	0:06:38
311QS	C680 / J	27,100	10/1/2010	14:51:49	14:54:34	15:03:46	0:02:45	0:09:12	0:11:57
910LX	E135 / J	40,785	10/1/2010	15:02:24	15:05:26	15:08:35	0:03:02	0:03:09	0:06:11
525LM	C525 / J	9,800	10/1/2010	15:04:00	15:05:41	15:10:09	0:01:41	0:04:28	0:06:09
673DC	EMB500 / J	10,500	10/1/2010	15:21:02	15:23:36	15:40:25	0:02:34	0:16:49	0:19:23
421LT	C560 / J	15,200	10/1/2010	15:23:38	15:26:48	15:38:05	0:03:10	0:11:17	0:14:27
10655	B100 / T	11,875	10/1/2010	15:34:39	15:38:43	15:41:11	0:04:04	0:02:28	0:06:32
OY-LPU	C510 / J	8,730	10/1/2010	15:43:24	15:45:31	15:46:15	0:02:07	0:00:44	0:02:51
181SG	C560 / J	15,200	10/1/2010	15:45:20	15:47:54	15:49:31	0:02:34	0:01:37	0:04:11
510HS	C510 / J	8,730	10/1/2010	15:49:02	15:54:10	15:54:22	0:05:08	0:00:12	0:05:20
650LG	CL60 / J	36,000	10/1/2010	16:17:23	16:19:30	16:19:56	0:02:07	0:00:26	0:02:33
731PS	BE40 / J	16,300	10/1/2010	16:22:48	16:25:34	16:26:43	0:02:46	0:01:09	0:03:55
420EH	C525 / J	9,800	10/1/2010	16:35:22	16:38:38	16:48:16	0:03:16	0:09:38	0:12:54
708GP	C525 / J	9,800	10/1/2010	16:58:53	17:01:57	17:02:32	0:03:04	0:00:35	0:03:39
7UF	GLF4 / J	58,500	10/1/2010	18:34:40	18:37:39	18:39:27	0:02:59	0:01:48	0:04:47
288MB	H900XP / J	28,120	10/1/2010	18:35:59	18:38:43	18:40:41	0:02:44	0:01:58	0:04:42
982QS	C750 / J	31,800	10/1/2010	19:08:21	19:11:31	19:13:31	0:03:10	0:02:00	0:05:10
453GS	CL60 / J	36,000	10/2/2010	7:42:15	7:45:12	7:56:39	0:02:57	0:11:27	0:14:24
828VV	PC12 / T	9,039	10/2/2010	7:52:07	7:54:40	7:57:22	0:02:33	0:02:42	0:05:15
246GS	C525 / J	9,800	10/2/2010	8:59:59	9:02:15	9:06:07	0:02:16	0:03:52	0:06:08
360AV	G150 / J	26,250	10/2/2010	9:05:17	9:07:50	9:13:04	0:02:33	0:05:14	0:07:47
842FL	H800XP / J	21,200	10/2/2010	10:29:19	10:31:51	10:34:07	0:02:32	0:02:16	0:04:48
600QS	C560 / J	15,200	10/2/2010	10:48:01	10:51:14	10:54:51	0:03:13	0:03:37	0:06:50
117WR	GLF4 / J	58,500	10/2/2010	11:24:31	11:28:17	11:30:06	0:03:46	0:01:49	0:05:35
85ER	C525 / J	9,800	10/2/2010	12:02:46	12:06:10	12:11:38	0:03:24	0:05:28	0:08:52
583QS	C560 / J	15,200	10/2/2010	12:03:22	12:05:55	12:12:12	0:02:33	0:06:17	0:08:50
101AR	BE40 / J	16,300	10/2/2010	12:36:58	12:39:36	12:46:11	0:02:38	0:06:35	0:09:13
897QS	H900-XP / J	28,120	10/2/2010	13:18:25	13:21:33	13:22:38	0:03:08	0:01:05	0:04:13
929QS	C750 / J	31,800	10/2/2010	13:23:20	13:25:24	13:31:55	0:02:04	0:06:31	0:08:35
580QS	C560 / J	15,200	10/2/2010	13:35:11	13:37:20	13:38:44	0:02:09	0:01:24	0:03:33
300TN	B300 / T	14,000	10/2/2010	13:44:21	13:45:13	13:45:38	0:00:52	0:00:25	0:01:17
536FX	CL30 / J	33,750	10/2/2010	14:12:12	14:14:38	14:16:20	0:02:26	0:01:42	0:04:08

Aircraft No.	Aircraft Model / Type	Aircraft Weight	Date	Taxi Begins (a)	Hold Begins (b)	Departure Time (c)	Total Taxi (b-a)	Total Hold (c-b)	Grand Total (c-a)
417C	C525 / J	9,800	10/2/2010	14:24:02	14:25:40	14:26:11	0:01:38	0:00:31	0:02:09
399QS	C560 / J	15,200	10/2/2010	16:08:30	16:10:44	16:14:27	0:02:14	0:03:43	0:05:57
41VP	C560 / J	15,200	10/2/2010	16:43:00	16:45:06	16:50:00	0:02:06	0:04:54	0:07:00
972MS	GLF4 / J	58,500	10/2/2010	17:06:00	17:08:42	17:11:31	0:02:42	0:02:49	0:05:31
888QS	H900-XP / J	28,120	10/2/2010	18:01:27	18:03:42	18:05:21	0:02:15	0:01:39	0:03:54
7UF	GLF4 / J	58,500	10/2/2010	19:48:16	19:51:31	19:54:05	0:03:15	0:02:34	0:05:49
599QS	C56X / J	20,200	10/2/2010	19:55:44	19:57:40	19:58:30	0:01:56	0:00:50	0:02:46
755PA	GALX / J	35,000	10/3/2010	8:05:56	8:08:31	8:11:39	0:02:35	0:03:08	0:05:43
215QS	F2TH / J	33,000	10/3/2010	8:57:39	9:00:02	9:00:38	0:02:23	0:00:36	0:02:59
8096U	BE90 / T	9,168	10/3/2010	9:36:34	9:39:18	9:43:02	0:02:44	0:03:44	0:06:28
902DW	F900 / J	42,000	10/3/2010	9:50:51	9:53:57	9:55:15	0:03:06	0:01:18	0:04:24
682QS	C560 / J	15,200	10/3/2010	9:55:07	9:57:09	10:02:21	0:02:02	0:05:12	0:07:14
486QS	GLF4 / J	58,500	10/3/2010	10:24:09	10:27:32	10:30:24	0:03:23	0:02:52	0:06:15
134LJ	LJ31 / J	15,300	10/3/2010	11:06:23	11:08:44	11:09:13	0:02:21	0:00:29	0:02:50
805LX	H800XP / J	21,200	10/3/2010	11:09:57	11:12:14	11:16:43	0:02:17	0:04:29	0:06:46
904FL	E135 / J	40,785	10/3/2010	11:14:15	11:16:31	11:18:07	0:02:16	0:01:36	0:03:52
11BV	F2TH / J	33,000	10/3/2010	11:45:38	11:48:27	11:51:29	0:02:49	0:03:02	0:05:51
453GS	CL60 / J	36,000	10/3/2010	12:13:01	12:16:13	12:18:41	0:03:12	0:02:28	0:05:40
708GP	C525 / J	9,800	10/3/2010	12:26:50	12:29:33	12:40:51	0:02:43	0:11:18	0:14:01
888QS	H900XP / J	28,120	10/3/2010	12:54:55	12:57:23	13:02:27	0:02:28	0:05:04	0:07:32
312CC	LJ31 / J	15,300	10/3/2010	13:20:26	13:23:02	13:24:49	0:02:36	0:01:47	0:04:23
525KR	C525 / J	9,800	10/3/2010	13:56:08	13:59:14	13:59:36	0:03:06	0:00:22	0:03:28
466MW	B200 / T	12,500	10/3/2010	14:42:18	14:44:06	14:45:42	0:01:48	0:01:36	0:03:24
417TM	H800XP / J	21,200	10/3/2010	15:07:27	15:10:28	15:30:12	0:03:01	0:19:44	0:22:45
602LP	F2TH / J	33,000	10/3/2010	16:04:50	16:07:31	16:08:36	0:02:41	0:01:05	0:03:46
22UL	S550 / J	11,000	10/3/2010	16:24:11	16:28:37	16:34:39	0:04:26	0:06:02	0:10:28
512TB	C525 / J	9,800	10/3/2010	16:47:27	16:51:07	16:52:08	0:03:40	0:01:01	0:04:41
673DC	EMB500 / J	10,500	10/3/2010	18:12:08	18:14:43	18:16:00	0:02:35	0:01:17	0:03:52
645PC	PC12 / T	9,039	10/3/2010	18:27:43	18:30:12	18:40:08	0:02:29	0:09:56	0:12:25
246GS	C525 / J	9,800	10/3/2010	18:52:45	18:56:00	18:57:15	0:03:15	0:01:15	0:04:30

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A Geospatial Analysis of the Effects of Aviation Gasoline on Childhood Blood Lead Levels

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The authors have no competing financial interests with regard to this manuscript.

Abbreviations (as defined in the text):

Avgas	Aviation gasoline
CDC	Centers for Disease Control and Prevention
CI	Confidence interval
EPA	Environmental Protection Agency
GIS	Geographic Information Systems
LL	Low-lead
NHANES	National Health and Nutrition Examination Survey

Abstract

Background: Aviation gasoline, commonly referred to as avgas, is a leaded fuel used in small aircraft. Recent concern about the effects of lead emissions from planes has motivated the EPA to consider regulating leaded avgas.

Objective: This study investigates the relationship between lead from avgas and blood lead levels in children living in six counties in North Carolina.

Methods: We used Geographic Information Systems (GIS) to approximate areas surrounding airports in which lead from avgas may be present in elevated concentrations in air and may also be deposited to soil. We then used regression analysis to examine the relationship between residential proximity to airports and NC blood lead surveillance data in children aged 9 months to 7 years while controlling for factors including age of housing, socioeconomic characteristics, and seasonality.

Results: Our results suggest that children living within 500 m of an airport at which planes use leaded avgas have higher blood lead levels than other children. This apparent effect of avgas on blood lead levels was evident among children living within 1000 m of airports. The estimated effect on blood lead levels exhibited a monotonically decreasing dose-response pattern, with the largest impact on children living within 500 m.

Conclusions: We estimated a significant association between potential exposure to lead emissions from aviation gasoline and blood lead levels in children. While the estimated increase was not especially large, the results of this study are nonetheless directly relevant to the policy debate surrounding the regulation of leaded avgas.

Introduction

Lead poisoning in children living in the United States has declined dramatically over the last several decades as a result of banning leaded gasoline, lead-based paint, and lead solder in plumbing. Nevertheless, children in the United States continue to be exposed to lead. The 2007–2008 National Health and Nutrition Examination Survey (NHANES) survey found blood lead levels at or above the Centers for Disease Control and Prevention's (CDC) blood lead action level of 10 μg/dL in about 1.1% of 1- to 5-year-olds, or about 270,000 children (National Center for Health Statistics 2010). Even more worrisome is a large body of recent research that demonstrates negative health effects, including learning disabilities and behavioral disorders, associated with lead exposure levels well below the CDC's action level (Canfield et al. 2003; Chiodo et al. 2004; Lanphear et al. 2000; Schnaas et al. 2006). A study by Miranda et al. suggests that early childhood blood lead levels as low as 2 μg/dL can have significant impacts on academic performance as measured by end-of-grade test scores (Miranda et al. 2006; Miranda et al. 2009; Miranda et al. 2010). In response to this body of research, the CDC has stated that there is no "safe" level for blood lead in children (CDC 2005).

One source of lead exposure that is often overlooked is aviation fuel. Lead emitted from aircraft using leaded avgas is currently the largest source of lead in air in the United States, constituting about 50 percent of lead emissions in the 2005 National Emissions Inventory (US EPA 2010). While leaded gasoline for automobiles was phased out of use in the United States by 1995, lead is still permitted in aviation gasoline. Lead is added to avgas in order to achieve the high octane required for the engines of piston-driven airplanes. The most commonly used fuel for piston-driven aircraft in the U.S. is known as Avgas 100LL. While the "LL" stands for low-lead, 100LL gasoline contains up to 0.56 g/L of lead (Royal Dutch Shell 2010). Another

grade of avgas, Avgas 100, contains higher amounts of lead and is still in widespread use. Newer varieties of avgas without lead, including 82 UL and 94 UL, have recently been introduced. These unleaded fuels are not used as commonly as the two leaded grades, however, because their octane ratings are too low for many small aircraft engines.

Previous research indicates that lead levels in air near airports where planes use avgas are significantly higher than background levels. A study at the Santa Monica airport in California found that the highest lead levels occur close to airport runways and decrease exponentially with distance from an airport, dropping down to background levels at about 1 km (US EPA 2010). Another study at Toronto-Buttonville airport found that the average air lead level near the airport was 4.2 times higher than the background air lead level in Toronto over a 24-hour period (Environment Canada 2000), and a study at Chicago O'Hare airport found that air lead levels were significantly higher downwind from the airport than upwind (Illinois EPA 2002).

Thus the combustion of leaded avgas by small airplane engines may pose a health risk to children who live or attend school near airports. The lead in air surrounding airports can be inhaled directly, or the lead may be ingested by children after it settles into soil or dust (US EPA 2010). The EPA estimates that people living within 1 km of airports are at risk of being exposed to lead from avgas (Hitchings 2010). The EPA further notes that about 16 million people live within 1 km of an airport with planes using avgas, and 3 million children attend school within 1 km of these airports (US EPA 2010).

Due to the risk of lead poisoning from avgas, environmental groups have pressured the EPA to take action to reduce lead emissions from aviation fuel. One environmental group, Friends of the Earth, has petitioned the EPA to find endangerment from and regulate lead in avgas. The EPA has responded with an Advanced Notice for Proposed Rulemaking on aviation

fuel, and solicited comments and further research about the effects of lead in avgas away (US EPA 2010). The EPA has refrained from establishing a date by which aircraft would be required to use unleaded fuel (AOPA ePublishing staff 2010).

This paper seeks to contribute to research regarding the risk of lead in avgas by determining whether living near airports where avgas is used has a discernible impact on blood lead levels in children. Previous studies have examined whether lead from avgas is present in air and soil near airports. Our work seeks to link avgas exposure to childhood blood lead levels. To elucidate the effects of avgas on blood lead levels, we compare blood lead levels in children living near airports in six counties in North Carolina to those in children living farther away from airports but residing in the same counties. We use a multiple regression model to control for other variables that have previously been found to affect blood lead levels (CDC 1991; CDC 1997; Sargent et al. 1995) in an effort to isolate the impact of avgas. The results of this study are directly relevant to the policy debate surrounding the regulation of leaded aviation gasoline.

Methods

We obtained a database of airports in North Carolina from the EPA's Office of Transportation and Air Quality. The database contained estimates for the annual lead emissions from each airport, along with the spatial location of each facility. We used ArcGIS 9.3 (ESRI, Redlands, WA) to plot the locations of these airports against a county boundary map of North Carolina. We selected six counties in North Carolina (Carteret, Cumberland, Guilford, Mecklenburg, Union, and Wake, see Figure 1). Counties were selected based on whether they contained multiple airports with significant air traffic, where significant numbers of children had

been screened for lead exposure, and where the county tax assessor data would allow us to control for age of housing as an important confounder when assessing avgas as a source of lead exposure (Table 1). Because we wanted to control for risk from deteriorating lead-based paint, we selected counties where the county tax assessor data contained a well-populated field for age of housing. We obtained NC blood lead surveillance data for all children in the study counties between the ages of 9 months and 7 years who had been tested for lead between 1995 and 2003 from the Children's Environmental Health Branch, within the North Carolina Department of Environment and Natural Resources. Because we were unable to ascertain where the children attended school, we were not able to control for the location of their school relative to the airports. We note that most of the children screened for lead are not yet old enough to be attending school. All aspects of this study were conducted in accordance with a human subjects research protocol approved by Duke University's Institutional Review Board.

After selecting our six study counties, we used Geographic Information Systems (GIS) to delineate fixed distance areas around each airport where aircraft use avgas. We also used GIS to connect the point locations of the airports given by address to tax parcel layers for each county via shared geography. The tax parcel layers contain a polygon shape representing the property boundary of each airport. We then created buffers around each of the airport polygons to represent the area in which airplane emissions could affect air lead levels. Because previous research has indicated that lead concentrations increase exponentially with proximity to airports (Piazza 1999), we created buffers that extended 500 m, 1000 m, 1500 m, and 2000 m from the polygon edges of the airport tax parcels. Figure 2 depicts this approach using the example of Wake County. Airports are indicated by the darkest shade of pink with the different distance buffers represented by increasingly lighter shades of pink. The residential addresses of the

children who were screened for blood lead is then overlaid, as shown by the green points. Please note that, in accordance with our IRB protocol, the green dots do not represent the actual locations of where children were screened for lead. For publicly displayed maps like Figure 2, we randomly move the actual location of the child within a fixed radial buffer, a technique known as jittering. The analysis itself, however, is done on the true locations of the children. The 500 m, 1000 m, 1500 m, and 2000 m buffers only approximate the area that could be affected by lead emissions from airports, as wind directions can alter the dispersal pattern of lead particles. Nevertheless, with varied wind directions and planes that take off in multiple directions, our buffers offer a reasonable approximation of the area over which lead from avgas might disperse.

North Carolina maintains a mandatory statewide registry of blood lead surveillance data. We obtained NC blood lead surveillance data for 1995 through 2003, as these years bracket the 2000 Census data. In previous work designed to develop childhood lead exposure risk models (Kim et al. 2008; Miranda et al. 2002), we had already geocoded the residential addresses of children screened for lead. Our geocoding success rates ranged from 37-89% across the six study counties. Details on how the blood lead surveillance data were processed are described in Miranda et al. (2002) and Kim et al. (2008).

We then joined the buffered airport polygons in our six study counties with the geocoded addresses of children who have been screened for blood lead. This enabled us to generate a table containing blood lead screening results and four dummy variables representing whether each child lived within 500 m, 1000 m, 1500 m, or 2000 m of an airport.

We supplemented the blood lead screening and airport location data with data from county tax assessor databases on age of housing (to control for lead exposure risks from

deteriorating lead-based paint), resolved at the individual tax parcel level. In addition, we used U.S. Census 2000 data on household median income (measured in tens of thousands) and proportion receiving public assistance, which were obtained at the Census block group level, as well as proportion non-Hispanic black and proportion Hispanic, which were obtained at the Census block level. Since previous work has shown the season of blood lead screening to be a significant predictor of blood lead levels (i.e., warm months are correlated with higher lead exposure from lead based paint) (Johnson et al. 1996; Kim et al. 2008; Miranda et al. 2007; Yiin et al. 2000), we created individual level dummy variables representing the season in which each child was screened for lead. Because the blood lead screening data are right-skewed, we used the natural logarithm of blood lead level in our analyses. We used the spatial data architecture described above to regress logged blood lead levels on the proximity to airport variable, controlling for age of housing, season in which the child was screened, and the Census demographic variables. We used multivariable regression analysis clustered at the Census block group level with inverse population weights at the tax parcel level to ensure that parcels with multiple blood lead screens did not overly influence the analysis. We implemented crude and adjusted regression models for each of the four proximity to airport variables. We used a categorical distance to airport variable with 0 to 500 m, 501 to 1000 m, 1001 to 1500 m, and 1501 to 2000 m, with a reference group of greater than 2000 m. In addition, we performed a sensitivity analysis on our findings. First, we investigated whether the use of inverse population weights accounted for possible correlation among observations from the same tax parcel by running multilevel random intercept models designating the parcel as the grouping variable. Second, we considered the possibility of temporal confounding by including the lead screen year as a factor in each model with the reference year as 1995. Results regarding the importance of

distance to airports were robust across these alternative specifications. We examined the results of these regressions to determine whether living near an airport using avgas had significant effects on blood lead levels. Statistical significance was set at α=0.05

Results

Blood lead screening data were available for 125,197 children in the study counties (Table 1), including 13,478 children living within 2000 m of an airport polygon in the six study counties (Table 2).

Our statistical results are shown in Table 3. In unadjusted models, logged blood lead levels were significantly and positively associated with residential proximity to an airport, with the size of the association being larger for children living closer to airports. While controlling for individual and group level confounders attenuated the association between logged blood lead levels and residential proximity to an airport, evidence of a deleterious relationship remained. In the adjusted models, control variables behaved as expected: relative to being screened in the winter season, children tested in the spring, summer, or fall had, on average, increased blood lead levels. Residence in poor and minority neighborhoods was also associated with elevated lead levels. In contrast, recently constructed housing units were associated with decreased mean lead levels. The above associations were consistent between the within distance and categorical distance regression models.

In the within distance buffer specification for the adjusted models, blood lead levels were significantly associated with residing within 500 m (coefficient=0.043, 95% CI: 0.006, 0.080), 1000 m (coefficient =0.037, 95% CI: 0.010, 0.065), and 1500 m (coefficient =0.021, 95% CI:

0.0008, 0.041) of an airport. Blood lead levels were not associated with living at greater distances. Importantly, the magnitude of the coefficient on the distance to airport variables was largest for those children living within 500 m and decreased in a dose-response fashion out to 1500 m. Based on the distance to airport coefficients, children living within 500 m, 1000 m, or 1500 m of an airport had average blood lead levels that were 4.4%, 3.8%, or 2.1% higher, respectively, than other children.

In the categorical distance specification, compared to the reference category (>2,000 m from an airport), children living within 500 m from an airport had blood lead levels that were, on average, 4.4 % higher (coefficient=0.043, 95% CI: 0.006, 0.080) (Table 3). In addition, the coefficient for the 501 to 1000 m category was marginally significant (coefficient=0.034, 95% CI: -0.003, 0.072). Neither the 1001 to 1500 m, nor the 1501 to 2000 m category was significant at the 5 percent level, with coefficient estimates near the null value. These results taken collectively suggest that children living within 500 meters and within 1000 meters are driving the results in the models that entered the within distance threshold variables separately.

Discussion

Based on the geospatial and statistical analysis presented above, lead from aviation gasoline may have a small (2.1% – 4.4%) but significant impact on blood lead levels in children who live in close proximity to airports where avgas is used. Importantly, the magnitude of the estimated effect of living near airports was largest for those children living within 500 m and decreased in a monotonic fashion out to 1500 m. Because our model only takes into account whether a child is living anywhere in a fixed distance (500 m, 1000 m, or 1500 m) radius of an

airport, children who live very close to or downwind from a runway could be affected more significantly than the average value that we estimate for all children living within the buffer.

Our finding that living beyond 1000 m of an airport using avgas does not have a significant relationship with blood lead levels is reasonably consistent with previous research suggesting that lead drops to background levels beyond 1000 m from an airport (Piazza 1999).

Our study has several important limitations. It does not take into account wind patterns that could increase the extent of the area containing lead particles from avgas in certain directions and decrease it in others. Furthermore, our model only considers whether children live anywhere within a particular distance from an airport and does not consider the fact that some points within this area could have higher air lead concentrations than others. Our modeling of the relationship between avgas and blood lead could be improved by incorporating wind direction information, by obtaining information about where piston-engine aircraft typically take off or land at each airport, and by controlling for air traffic volume. In addition, the variability in our geocoding success rates may introduce spatial bias. To partially address this, we reran the analysis without Union County, which had the lowest geocoding rate (37% compared with 58% for the remaining counties combined). The distance from airport results were robust to this change in the dataset. We also note that if one includes a rural county like Union County, geocoding rates are inevitably poor. We felt it important to include a rural county, so report results with Union County data. Nonetheless, the analysis presented here would be strengthened with better geocoding rates. Finally, extending the study to additional counties throughout the United States could increase sample size and determine whether the trends that we observed in North Carolina are replicated elsewhere in the country. The methods we describe here for

constructing buffer zones around airports could easily be replicated in other areas nationally (or internationally).

Conclusions

Our analysis indicates that living within 1000 m of an airport where aviation gasoline is used may have a significant effect on blood lead levels in children. Our results further suggest that the impacts of aviation gasoline are highest among those children living closest to the airport. This study adds to the literature examining whether leaded avgas poses risks to children's health and speaks directly to the ongoing policy debate regarding the regulation of leaded aviation gasoline.

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Table 1. Number of airports, estimate of lead emissions from aircrafts, and number of blood lead screens among children age 9 months to 7 years in study counties, North Carolina (1995-2003)

County	Number of Airports	Estimated Lead Emissions (Tons/Year)	Number of Blood Lead Screens
Carteret	8	0.224	3,333
Cumberland	11	0.238	14,854
Guilford	10	0.369	27,043
Mecklenburg	10	0.894	47,510
Union	14	0.285	3,387
Wake	13	0.624	29,070

Table 2. Individual and group-level characteristics of children age 9 months to 7 years who were screened for blood lead in1995-2003 (N=125,197)

Characteristic	Value
Individual-level	
Blood lead level (μg/dL), arithmetic mean ± SD	3.88 ± 2.94
Season in which blood lead screening occurred[a], % (n)	
Winter	21.72 (27,189)
Spring	24.44 (30,593)
Summer	28.16 (35,256)
Fall	25.69 (32,159)
Residential proximity to airport, % (n)	
Within 500 m of an airport	1.01 (1,267)
Within 1000 m of an airport	2.92 (3,649)
Within 1500 m of an airport	6.49(8,122)
Within 2000 m of an airport	10.77 (13,478)
Greater than 2000 m of an airport	89.23 (111,719)
Year built of child's residence, mean ± SD	1970 ± 20.10
Group-level, mean ± SD	
Proportion black[b]	0.39 ± 0.33
Proportion Hispanic[b]	0.09 ± 0.15
Household median income (10,000s)[c]	4.38 ± 2.09
Proportion receiving public assistance[c]	0.04 ± 0.05

[a]Winter refers to the months of December, January, and February, spring the months of March through May, summer June through August, and fall, September through November.
[b]Resolved at the Census block level.
[c]Resolved at the Census block group level.

Table 3. Change in logged blood lead level associated with a child's residential proximity to airport using multiple linear regression (N=125,197)

Within distance buffers[a]			Categorical distance measure		
Covariate	Coef.	95% CI	Covariate	Coef.	95% CI
Unadjusted			Unadjusted		
Within 500 m	0.089***	0.034, 0.144	Between 0 and 500 m	0.094***	0.038, 0.150
Within 1000 m	0.084***	0.036, 0.133	Between 501 and 1000 m	0.085***	0.027, 0.142
Within 1500 m	0.077***	0.039, 0.116	Between 1001 and 1500 m	0.071***	0.023, 0.119
Within 2000 m	0.052***	0.018, 0.087	Between 1501 and 2000 m	0.016	-0.022, 0.053
			Greater than 2000 m	Ref	
Adjusted[b]			Adjusted[b]		
Within 500 m	0.043**	0.006, 0.080	Between 0 and 500 m	0.043**	0.006, 0.080
Within 1000 m	0.037***	0.010, 0.065	Between 501 and 1000 m	0.034*	-0.003, 0.072
Within 1500 m	0.021**	0.0008, 0.041	Between 1001 and 1500 m	0.007	-0.020, 0.034
Within 2000 m	0.003	-0.013, 0.020	Between 1501 and 2000 m	-0.019*	-0.041, 0.003
			Greater than 2000 m	Ref	

* $p < 0.10$ ** $p < 0.05$ *** $p < 0.01$

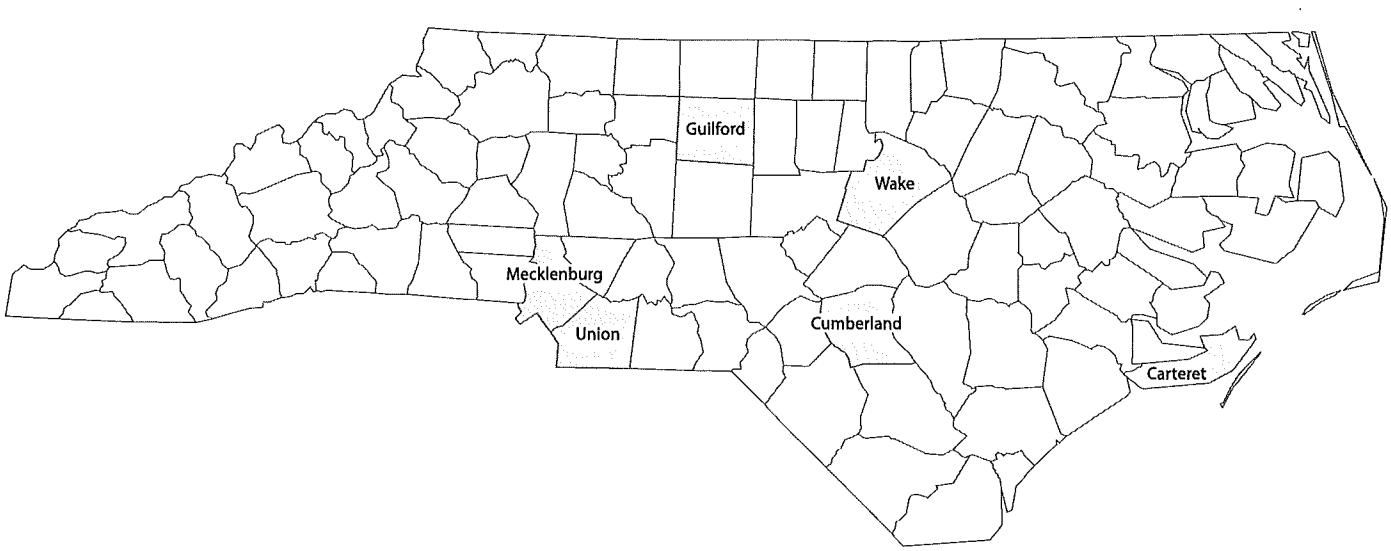
[a]Within distance thresholds were entered in separate regression models.

[b]Adjusted models control for Census block level proportion black and proportion Hispanic, Census block group level percent population receiving public assistance and household median income, as well as individual level dummy variables for the season in which a child was screened for blood lead.

Figure Legends

Figure 1. Study counties.

Figure 2. Illustration of airports buffered at distances of 500 m, 1000 m, 1500 m, and 2000 m in Wake County, North Carolina, plotted along with a jittered representation of the residential addresses of the children screened for blood lead.


Guilford
Wake
Mecklenburg
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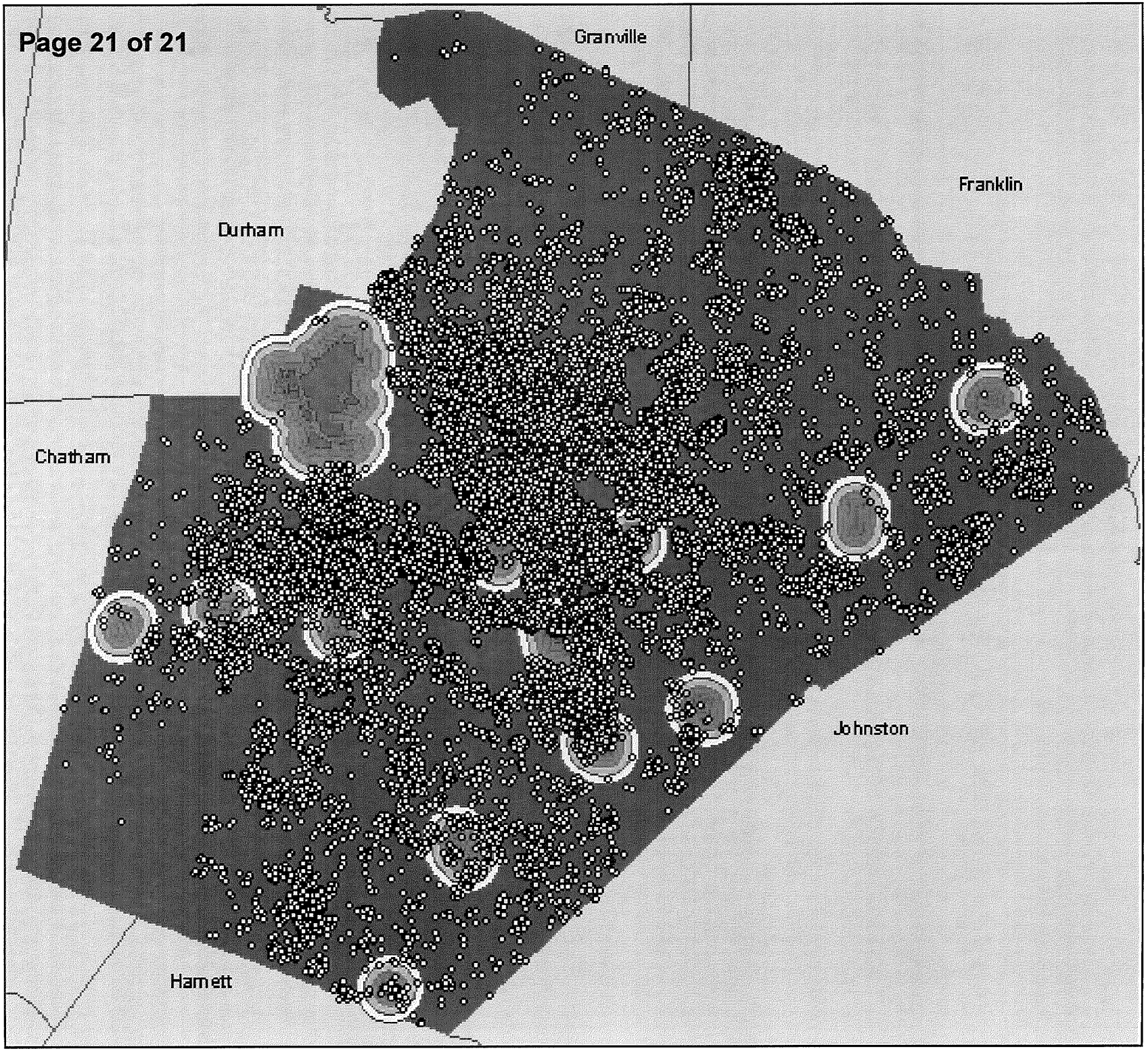
Cumberland
Carteret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Harnett

Lead Emissions from the Use of Leaded Aviation Gasoline in the United States

Technical Support Document

Assessment and Standards Division
Office of Transportation and Air Quality
U.S. Environmental Protection Agency

NOTICE

This technical report does not necessarily represent final EPA decisions or positions. It is intended to present technical analysis of issues using data that are currently available. The purpose in the release of such reports is to facilitate the exchange of technical information and to inform the public of technical developments.

EPA United States Environmental Protection Agency

EPA420-R-08-020
October 2008

The purpose of this Technical Support Document (TSD) is to provide a revised inventory for emissions of lead (Pb) from the use of leaded aviation gasoline (avgas). This inventory is an update from the version of the inventory presented in the 2002 and 2005 National Emissions Inventory (NEI). This document describes the revised method being used by the Environmental Protection Agency (EPA) to calculate the national inventory for lead emissions from leaded avgas. This method makes the estimation of lead emissions similar to the methods used by the Federal Aviation Administration (FAA) to estimate inventories of other criteria pollutants emitted by aircraft in its Emissions and Dispersion Modeling System (EDMS). This TSD also describes issues regarding further improvements that are needed for the avgas lead inventory to account for all the lead emitted by the combustion of leaded avgas annually.

Background information regarding the use of leaded aviation gasoline in piston-engine powered aircraft is available in other documents.[1,2] Briefly, most piston-engine aircraft fall into the categories of either general aviation (GA) or air taxi (AT). GA and AT aircraft include a diverse set of aircraft types and engine models and are used in a wide variety of applications. Lead emissions associated with GA and AT aircraft stem from the widespread use of one hundred octane low lead (100LL) avgas. The lead is added to the fuel in the form of tetraethyl lead (TEL). This lead additive helps boost fuel octane and prevents valve seat recession which can be a significant concern from a safety standpoint. Today, 100LL is the most commonly available type of aviation gasoline in the United States.[3] Lead is not added to jet fuel that is used in commercial aircraft, military aircraft, or other turbine-engine powered aircraft.

EPA's previous method for estimating airport-specific lead inventories that was used in the 2002 NEI is described in Section I and is available in other documents.[4] The revised method for estimating airport-specific lead inventories is descri
and includes information regarding potential data inputs that states and local authorities could use to improve airport-specific lead emissions estimates. Section III of this document outlines the additional data and refinements needed in the lead avgas inventory in order to account for all lead emissions from the use of leaded avgas nationwide. These improvements are being planned for the 2008 version of the NEI.

In this document, units of tons (i.e., U.S. short tons) are used when discussing the national lead inventory in order to be consistent with the manner in which NEI reports inventories for lead and other pollutants. Units of kilograms (kg) are used when

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[1] EPA (2007) Review of the National Ambient Air Quality Standards for Lead: Policy Assessment of Scientific and Technical Information. OAQPS Staff Paper. EPA-452/R-07-013 November 2007. pp 2-8 and 2-9.

[2] FAA William J. Hughes Technical Center
http://www.tc.faa.gov/act4/insidethefence/2006/0609_06_AvFuels.htm

[3] ChevronTexaco (2005) Aviation Fuels Technical Review. FTR-3.
http://www.chevronglobalaviation.com/docs/aviation_tech_review.pdf

[4] EPA (1998) Locating and Estimating Air Emissions from Sources of Lead and Lead Compounds. EPA-454/R-98-006. pages 7-8.

discussing airport-specific inventories to be consistent with the manner in which individual point sources are discussed in the context of the Lead National Ambient Air Quality Standards (NAAQS).

I. Airport-Specific Emissions of Lead from Piston-Engine Aircraft in the 2002 NEI

To estimate airport-specific lead inventories in the 2002 NEI, the national lead avgas inventory was allocated to individual airports based on the percentage of piston-engine operations at each airport. To calculate the national avgas lead inventory, the volume of leaded avgas produced in the U.S. in 2002 was multiplied by the concentration of lead in the avgas and by the fraction of lead emitted from a combustion system operating on leaded fuel (as discussed later, some lead is retained in the engine or engine oil). These parameters are described below. The following equation was used to calculate the national avgas lead inventory:

$$\text{Avgas lead emitted/year} = \text{avgas gal} \times [\text{Pb}] \times 0.75$$

The volume of avgas produced in the U.S. in 2002 was 6,682 thousand barrels or 280,644,000 gallons.[5] The concentration of lead in avgas ([Pb] in the above equation) can be one of four levels (ranging from 0.14 to 1.12 grams of lead per liter) as specified by the American Society for Testing and Materials (ASTM). By far the most common avgas supplied is "100 Low Lead" or 100LL.[6] The maximum lead concentration specified by ASTM for 100LL is 0.56 grams per liter or 2.12 grams per gallon.[7] A fraction of lead is retained in the engine, engine oil and/or exhaust system. EPA has historically used a value of 25% vehicle retention for lead when it is added to automotive gasoline.[8] For aviation engines, we identified this value as a likely overestimate of the amount of lead retained; however, we did not have data specific for aviation engines at the time the 2002 inventory was finalized. This estimate of retention in an engine has been revised as discussed in Section II below.

For the 2002 NEI, the national estimate of lead emissions from the consumption of avgas was

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[5] DOE Energy Information Administration. Fuel production volume data obtained from http://tonto.eia.doe.gov/dnav/pet/hist/mgaupus1A.htm accessed November 2006.

[6] ChevronTexaco (2005) Aviation Fuels Technical Review. FTR-3.

[7] ASTM International (2005) Annual Book of ASTM Standards Section 5: Petroleum Products, Lubricants, and Fossil Fuels Volume 05.01 Petroleum Products and Lubricants (I): D 56 – D 3230.

[8] U.S. Environmental Protection Agency. (2007) Airport-specific emissions of lead from combustion of leaded aviation gasoline. ftp://ftp.epa.gov/EmisInventory/2002finalnei/mobile_sector_data/080207_aircraft_supplemental_data/

$$\frac{(280{,}644{,}000 \text{ gal})(2.12 \text{ g Pb/gal})(0.75)}{907{,}180 \text{ g/ton}} = 491.9 \text{ tons Pb}$$

The 491.9 tons of lead was allocated to 3,410 airports located throughout the U.S. based on each airport's percentage of the piston-engine aircraft landing and take-off (LTO) activity at these airports. The operations data used to allocate lead to airports for this estimate can be found in the FAA's Terminal Area Forecast (TAF) system for the year 2002.[9] The TAF is the official forecast of aviation activity at FAA facilities.[10] These airport-specific lead emissions estimates in the NEI include lead emitted during all operational modes of a flight, which includes taxi/idle-out, takeoff, climb-out, approach and taxi/idle-in (the LTO cycle) and cruise modes.

EPA understood that allocating lead emissions to airports from operations outside the LTO cycle overestimated the local emissions near airports because itinerant flights emit lead at altitudes and at distances from the airport as well as in the local area near the airport. As described in the following section of this memo, EPA has developed a new methodology, referred to as the LTO Methodology, to calculate airport-specific lead emissions attributable only to the LTO cycle for piston-engine aircraft. Section III of this document discusses lead emitted outside the LTO cycle during the cruise phase of flight.

For future inventories, EPA will use an equation similar to that described above to develop the national inventory for lead emissions from piston-engine powered aircraft. However, the equation will be modified using new information described below, to account for 5 percent retention of lead in the engine and oil of the aircraft during its operation. The new equation is as follows, and applied to 2002 avgas supply, results in an estimated 622.8 tons of lead emitted in 2002:

$$\frac{(280{,}644{,}000 \text{ gal})(2.12 \text{ g Pb/gal})(0.95)}{907{,}180 \text{ g/ton}} = 622.8 \text{ tons Pb}$$

II. Revised Methodology for Estimating Airport-Specific Pb Emissions

Historically, aircraft gaseous and particulate matter (PM) emissions have been calculated through the FAA's EDMS.[11] This modeling system was designed to develop emission inventories for the purpose of assessing potential air quality impacts of airport operations and proposed airport development projects. However, EDMS is currently not set up to calculate lead emissions from piston-powered aircraft, and thus, it is not a readily available tool for determining airport lead inventories related to aircraft

[9] The number of LTOs at a facility is calculated by dividing the number of operations by two (LTOs = operations/2).

[10] Terminal Area Forecast available from http://aspm.faa.gov/main/taf.asp

[11] EDMS available from http://www.faa.gov/about/office_org/headquarters_offices/aep/models/edms_model/

operations. In developing this revised approach to determine piston-engine aircraft lead emissions, we relied upon the basic methodology employed in EDMS. This requires as input the activity of piston-engine aircraft at a facility, fuel consumption rates by these aircraft during the various modes of the LTO and time in each mode (taxi/idle-out, takeoff, climb-out, approach, and taxi/idle-in), the concentration of lead in the fuel and the retention of lead in the engine and oil. The equation used to calculate airport-specific lead emissions during the LTO cycle is below, followed by a description of each of the input parameters.

$$\text{LTO Pb(kg)} = \frac{\text{(piston-engine LTO)(avgas gal/LTO)([Pb])(1-Pb retention)}}{\text{1,000 g/kg}}$$

- Piston-engine LTO: Most piston-engine aircraft fall into the categories of either general aviation (GA) or air taxi (AT). Some GA and AT activity is conducted by turboprop and turbojet aircraft which do not used leaded avgas. There are no national databases that provide airport-specific LTO activity data for piston-engine aircraft separately from turbojet and turboprop aircraft. The fraction of GA and AT aircraft that use piston engines will vary by airport. However, in the absence of airport-specific data, a national default estimate was derived using FAA's GA and AT Activity (GAATA) Survey.[12] The 2005 GAATA Survey reports that approximately seventy-two percent (72%) of all GA and AT LTOs are from piston-engine aircraft which use avgas, and about twenty-eight percent (28%) are turboprop and turbojet powered which use jet fuel, such as Jet A.[13] Lead is not added to jet fuel. Therefore, to calculate piston-engine aircraft LTO as input for this equation, the total GA plus AT LTOs are multiplied by 0.72.

- Avgas use (gal/LTO): Piston-engine aircraft can have either one or two engines. EDMS version 5.0.2 contains information on the amount of avgas used per LTO for some single and twin-engine aircraft. The proportion of piston-engine LTOs conducted by single- versus twin-engine aircraft was taken from the FAA's GAATA Survey for 2005 (90% of LTOs are conducted by aircraft having one engine and 10% of LTOs by aircraft having two engines). Since twin-engine aircraft have higher fuel consumption rates than those with single engines, a weighted average LTO fuel usage rate was established to apply to the population of piston-engine aircraft as a whole. For the single-engine aircraft, the average amount of fuel consumed per LTO was determined from the six types of single piston-engine aircraft within EDMS.[14] This was accomplished by averaging the single-engine EDMS outputs for fuel consumed per LTO using the EDMS scenario property of ICAO/USEPA Default - Times in Mode (TIM), with a 16

[12] The FAA GAATA is a database collected from surveys of pilots flying aircraft used for general aviation and air taxi activity. For more information on the GAATA, see Appendix A at http://www.faa.gov/data_statistics/aviation_data_statistics/general_aviation/

[13] There are about 194,000 piston-engine aircraft in the U.S. general aviation and air taxi fleet (175,000 single-engine and 19,000 twin-engine aircraft) according to FAA's 2005 GAATA Survey.

[14] EPA understands that EDMS 5.0.2 has a limited list of piston engines, but these are currently the best data available.

minute taxi-in/taxi-out time according to EPA's *Procedures for Emission Inventory Preparation, Volume IV: Mobile Sources*, 1992.[15] This gives a value of 16.96 pounds of fuel per LTO (lbs/LTO). Next, the average single-engine consumption rate was divided by the average density of 100LL avgas, 6 pounds per gallon (lbs/gal), producing an average fuel usage for single-engine piston aircraft of 2.83 gallons per LTO (gal/LTO). This same calculation was performed for the two twin-engine piston aircraft within EDMS, producing an average LTO fuel usage rate for twin-engine piston aircraft of 9.12 gal/LTO.

Using these single- and twin-engine piston aircraft fuel consumption rates, a weighted average fuel usage rate per LTO was computed by multiplying the average fuel usage rate for single-engine aircraft (2.83 gal/LTO) by the fleet percentage of single-engine aircraft LTOs (90%). Next, the twin-engine piston aircraft average fuel usage rate (9.12 gal/LTO) was multiplied by the fleet percentage of twin-engine aircraft LTOs (10%). By summing the results of the single- and twin-engine aircraft usage rates, the overall weighted average fuel usage rate per LTO of 3.46 gal/LTO is obtained.

- Concentration of lead in fuel, [Pb]: The maximum lead concentration specified by ASTM for 100LL is 0.56 grams per liter or 2.12 grams per gallon. This amount of lead is normally added to assure that the required lean and rich mixture knock values are achieved. Multiplying this lead concentration in avgas by the weighted average fuel usage rate produces an overall average value of 7.34 grams of lead per LTO (g Pb/LTO) for piston engines: 3.46 gal/LTO x 2.12 g Pb/gal = 7.34 g Pb/LTO.

- Retention of lead in engine and oil (1-Pb Retention): Recent data collected from aircraft piston engines operating on leaded avgas suggests that about 5% of the lead from the fuel is retained in the engine and engine oil.[16] Thus the emitted fraction is 0.95. This information is used in calculating airport-specific lead inventories and will be used to develop future national estimates of lead emitted from the consumption of leaded avgas.

Applying these parameters in the equation above yields the following equation:

$$Pb(kg) = \frac{(\text{piston-engine LTO})(7.34 \text{ g Pb/LTO})\ (0.95)}{1{,}000 \text{ (g/kg)}}$$

which simplifies to:

[15] U.S. EPA, *Procedures for Emission Inventory Preparation, Volume IV: Mobile Sources*, EPA-450/4-81-026d (Revised), 1992.

[16] The information used to develop this estimate is from the following references: (a) Todd L. Petersen, Petersen Aviation, Inc, *Aviation Oil Lead Content Analysis*, Report # EPA 1-2008, January 2, 2008, available at William J. Hughes Technical Center Technical Reference and Research Library at http://actlibrary.tc.faa.gov/ and (b) E-mail from Theo Rindlisbacher of Switzerland Federal Office of Civil Aviation to Bryan Manning of U.S. EPA, regarding lead retained in engine, September 28, 2007.

$$Pb(kg) = (\text{piston-engine LTO})\ (7.0 \times 10^{-3})$$

$$\text{Where piston-engine LTO} = (\text{GA LTO} + \text{AT LTO})(0.72)$$

Appendix I provides revised airport-specific estimates of lead emissions from the LTO activity of piston-engine aircraft in 2002. There are short-comings to this approach that are potentially significant on an airport-specific basis. The LTO method described here for calculating airport-specific lead emissions is a significant improvement over the previous allocation method used in the 2002 NEI. The outputs from the LTO method form the best available estimates of airport-specific lead emissions available for a national-scale analysis. As is the case with all models, there is the potential for improvement and refinement based on input values specific to each airport as opposed to the broader national averages which were derived from the FAA and EPA documents.

Toward that end, the following information describes key data inputs for which the estimated national-scale default values could be improved upon to generate airport lead inventories tailored to specific airports. State and local authorities might have, or be able to collect better information for some of these key data inputs.

State/Local Data to Improve on the National Estimates of Lead emissions / LTO:

- In developing the national inventories, national average values were used to derive statistics for engines and fuel consumption rates. The selection of aircraft-engine combinations was informed by the FAA TAF of flights with adjustments for the ratio of piston-engine aircraft versus turboprop or turbine powered GA and AT. Specific airports could have a very different fleet mix than the one used in the national level analysis. This could lead to differences in the estimated inventories for a particular airport; however, local data for the types of aircraft and specific fuel consumption rates for aircraft operating at an airport could improve on the national average estimates.

- State and local authorities could use activity (i.e., LTO) data collected and reported by airports to FAA for a year more recent than 2002 and consider LTO activity averaged over a longer time period. A period of three years is advisable.

- State and local authorities could collect local data regarding the actual LTO activity for aircraft powered by piston engines at the airports being evaluated.

- EDMS 5.0.2 contains fuel consumption information for six single-engine piston aircraft and two twin-engine piston aircraft. Local data for fuel consumption rates by single- and twin-engine piston-powered aircraft operating at an airport could improve on the national average estimates used as well as data on the fraction of piston-engine aircraft powered by single- versus twin-engine aircraft at the airport being evaluated.

- The EDMS 5.0.2 has an LTO cycle broken down into five specific modes: taxi/idle-out, takeoff, climb-out, approach, and taxi/idle-in. The time in these modes can vary for each airport. Local authorities could apply airport-specific times in modes to estimate lead for individual airports, based on locally developed and documented studies.

- Exhaust emissions from piston-engine aircraft have not been extensively tested for lead emissions. Hence, emissions indices for these engines have been estimated solely on the basis of lead concentrations in avgas meeting aviation specifications. In the absence of actual emissions test results for existing engines operating in the relevant modes, these estimates could vary across engine families. In sum, relying on modeling systems that use generic defaults rather than performance based methods generates another source of variability in the estimates of lead emissions for the general aviation fleet.

- The third parameter in the equation provided above (i.e., 0.95) expresses the value of one minus the retention of lead. The retention of lead is accounted for since not all lead from the combustion of leaded avgas is emitted during operation. To limit lead deposit in engines, ethylene dibromide is added to leaded aviation gasoline and sometimes other additives are added to reduce spark plug fouling; these act as scavengers to reduce lead deposits within the engine. However, some lead is still retained in the engine and some is captured within the engine oil. Data available to EPA suggests that about five percent of the lead from avgas is retained in the engine and engine oil.[16] EPA is interested in data that state or local authorities might have that would change this estimate. In the absence of test data, this parameter should not be changed for an airport assessment.

- The concentration of lead in the most typical leaded aviation gasoline available, 100LL, is specified at a maximum value by the American Society for Testing and Materials (ASTM) Standard D 910. This concentration, 2.12 grams of lead per gallon of fuel, is maintained within tight specifications and should not be decreased or increased for the purposes of refining an airport lead inventory unless it is documented that a type of leaded avgas is used at the airport other than 100LL.

Section III. Future Improvements to the Avgas-Related Lead Inventory

As described in Section I above, EPA estimates that in 2002, the consumption of leaded avgas emitted 622.8 tons of lead to the air. In order to calculate the fraction of this lead that is currently accounted for in our revised 2002 inventory, we need to use the inventory in Appendix I below. This inventory has 3,413 airport facilities; minor changes in the airports included in this revised inventory compared to the 2002 NEI inventory are described briefly below and in greater detail in Appendix I. The 3,413 airports identified in the attached airport-specific lead inventory are estimated to

collectively emit 282 tons of lead (45% of the total lead emitted to the air from the use of leaded avgas), leaving 341 tons of lead for which we currently do not have sources identified in the NEI. The sources that are most likely to account for the 341 tons of lead include 1) over 16,000 airport facilities where leaded avgas is used but emissions are not accounted for in the NEI, and 2) lead emitted outside the LTO cycle (airport-specific lead emissions estimates account only for the lead emitted during taxi/idle-out, takeoff, climb-out, approach, and taxi/idle-in and do not account for lead emitted outside the LTO cycle during cruise). These two categories of information missing from the inventory and EPA's efforts to address them in future inventories are described below.

Lead emitted during the LTO cycle at airport facilities currently missing from EPA's NEI:

The NEI currently includes 3,410 airport facilities (three fewer than the inventory attached in Appendix I for reasons explained below) because these are the facilities for which the FAA's TAF database provides information regarding aircraft activity. The TAF database is prepared by FAA's Office of Aviation Policy and Plans and includes information for the airports in FAA's National Plan of Integrated Airport Systems (NPIAS). One of the goals of the NPIAS is to identify airports that are significant to national air transportation.

GA and AT aircraft operations occur at many more facilities than those identified in the TAF. FAA's Office of Air Traffic provides a complete listing of operational airport facilities in the National Airspace System Resources (NASR) database. The electronic report, referred to here as the 5010 airport data report, can be generated from the NASR database and is available for download from the internet. This report is updated every 56 days. In July 2008, the 5010 airport data report included information on 20,089 airport facilities in the U.S that submit data to the FAA.[17] Among the 20,089 facilities in the 5010 airport data report, lead estimates are not needed for a total of 108 facilities which fall into the following categories: closed airports and balloonports. Balloon craft do not use avgas (gliders are another category of aircraft that do not use avgas).[18] Lead emission estimates are warranted for the remaining 19,981 facilities. This information is summarized below:

- 20,089 Airport facilities in the 5010 airport data report
- 95 Closed permanently or indefinitely
- 13 Balloonports – no leaded avgas used
- 19,981 Airport facilities where lead emissions estimates are needed

Among the 19,981 facilities where an estimate of lead emissions is warranted in future inventories, 5,660 of these facilities report LTO data to FAA. LTO data for

[17]The data report was downloaded in June 2008 from the following website: http://www.faa.gov/airports_airtraffic/airports/airport_safety/airportdata_5010/ The database from which the airport facility report is downloaded is available at http://nfdc.faa.gov/index.jsp.

[18] Although gliders do not use avgas, we are investigating the potential activity of piston-engine aircraft at gliderports since gliders are typically towed aloft by piston-engine aircraft.

approximately 3,410 of the airport facilities come from FAA's TAF and LTO data for the remainder of the facilities (about 2,250 airport facilities) are from the 5010 airport data report. These LTO data from the 5010 airport data report may have been self-reported by airport operators through data collection accomplished by airport inspections performed by the airport inspectors who work for the State Aviation Agency, or obtained through other means.

Subtracting 5,660 from 19,981 leaves 14,321 airport facilities for which no LTO data are available. EPA is evaluating methods to estimate LTO activity at these small facilities. These facilities include a mixture of airport types (e.g., airport, seaport, STOLport, gliderport and heliport).

Lead emitted during flight operations outside the LTO cycle:

As described above, application of the new airport lead inventory method described in Section II of this TSD provides airport-specific lead inventories that do not include lead emitted outside the LTO cycle. The lead emitted outside the LTO cycle must therefore be accounted for in the inventory separately. Lead emissions to air undergo dispersion and eventually deposit to surfaces. Lead deposited to soil and water can remain available for uptake by plants, animals and humans for long periods of time.[19] The environmental transport and fate of lead is described in detail in EPA's Air Quality Criteria for Lead.[20] Accounting for all avgas-related lead emissions is especially important, because this source category currently contributes 45% of the total national inventory of lead emissions.

For inventory purposes, lead emitted outside the LTO cycle occurs during aircraft cruise mode and portions of the climb-out and approach modes. This part of an aircraft operation emits lead at various altitudes as well as close to and away from airports. GA flights are categorized as either local area or itinerant operations and this distinction plays a role in the area over which lead is emitted.

Local operations are performed by aircraft which operate in the local traffic pattern or within sight of the airport; execute simulated instrument approaches or low passes at the airport; operate to or from the airport in a designated practice area located within a 20-mile radius of the airport. Local operations are common for GA aircraft. This includes applications such as recreational, proficiency and instructional flying as well as many common general aerial support tasks. Emissions during local flying are more likely to influence air and soil concentrations of lead in the vicinity of the airport because they occur near the airport, often at altitudes below the mixing height.

Itinerant operations are all operations other than those described above as local operations. An itinerant aircraft operation usually is one in which the aircraft departs

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[19] Lead is a persistent, bioaccumulative and toxic (PBT) pollutant listed among EPA's 12 priority PBT pollutants. See the following website for more information http://www.epa.gov/pbt/index.htm.

[20] U.S. EPA, 2006. Air Quality: Criteria for Lead: 2006; EPA/600/R-5/144aF; U.S. Government Printing Office, Washington, DC, October, 2006.

from one airport and lands at a different airport. Depending on air time and distance, an itinerant flight is much more likely to involve departing the local flying area of the originating airport and climbing to altitudes above the mixing height. It is reasonable then, to generally expect that lead emitted outside the LTO cycle during itinerant operations in contrast with local operations, will be more widely dispersed and at greater distances. EPA is considering options for how to include lead emitted outside the LTO cycle in future versions of the NEI (i.e., 2008 and later).

Appendix I. Airport-specific estimates of lead emissions from the LTO activity of piston-engine aircraft.

EPA provided a 2002 airport-specific lead inventory in a memo to the Lead NAAQS docket in which lead estimates were calculated using the revised method described in Section II above.[21] The airport-specific inventory below was calculated in exactly the same manner as that provided in the memo to the Lead NAAQS docket. The inventory below differs from the inventory provided in that memo in three ways: 1) four airports which were not listed in the TAF but were listed in the NASR database were added to the inventory for which EPA estimates aviation gasoline (avgas)-related lead emissions are greater than 200 kg per year,[22] 2) the location identification, which is an airport-specific code, changed for 144 airports between 2002 and 2008 and the most recent codes are used here to identify airports, and 3) one airport, the Norfolk airport (location ID is 32M) in Norfolk, MA was closed before 2002 so this airport was deleted for the final 2002 lead airport inventory presented here.

As explained in Section III of this TSD, the sum of lead emissions at the 3,413 airport facilities listed in Table 1 below does not represent the total national lead inventory of lead emissions from combustion of leaded aviation gasoline. The method used to obtain the total emissions of lead from aviation gasoline is described in Section I.

In Table 1 below, 'FIPS' is the Federal Information Processing Standards code used to identify states and counties and 'Airport' is the airport-specific identifier and 'Kg/Yr' and 'Tons/Yr' are the estimates of lead emitted by piston-engine aircraft during the landing and take-off cycle at each airport.

Table 1. Airport-specific estimates of lead emissions at 3,414 airport facilities.

FIPS	Airport	AptState	ACounty	AprtName	Kg/Yr	Tons/Yr
06037	VNY	CA	LOS ANGELES	VAN NUYS	1,256	1.4
08005	APA	CO	ARAPAHOE	CENTENNIAL	1,074	1.2
04013	DVT	AZ	MARICOPA	PHOENIX DEER VALLEY	994	1.1
12117	SFB	FL	SEMINOLE	ORLANDO SANFORD	935	1.0
12127	DAB	FL	VOLUSIA	DAYTONA BEACH INTL	889	1.0
06037	LGB	CA	LOS ANGELES	LONG BEACH /DAUGHERTY F	847	0.9
04025	PRC	AZ	YAVAPAI	ERNEST A. LOVE FIELD	844	0.9
40143	RVS	OK	TULSA	RICHARD LLOYD JONES JR	813	0.9
21015	CVG	KY	BOONE	CINCINNATI/NORTHERN KEN	761	0.8
06059	SNA	CA	ORANGE	JOHN WAYNE AIRPORT-ORAN	731	0.8
38035	GFK	ND	GRAND FORKS	GRAND FORKS INTL	697	0.8
26125	PTK	MI	OAKLAND	OAKLAND COUNTY INTERNAT	691	0.8

[21] Memo to the Pb NAAQS Docket EPA-HQ-OAR-2006-0735-5483 Titled, Correction to May 1, 2008 Memorandum titled 'Revised Airport-specific Lead Emissions Estimates'.

[22] These four facilities were included in this revised inventory for the purposes of the Pb NAAQS and are described in a memo titled, 'Four additional airports where aviation gasoline-related lead emissions estimates are greater than 200 kg' that is available in the NAAQS Docket EPA-HQ-OAR-2006-0735.

04013	FFZ	AZ	MARICOPA	FALCON FLD	672	0.7
53033	BFI	WA	KING	BOEING FIELD/KING COUNT	663	0.7
17031	ORD	IL	COOK	CHICAGO O'HARE INTL	661	0.7
48439	DFW	TX	TARRANT	DALLAS/FORT WORTH INTER	650	0.7
06037	POC	CA	LOS ANGELES	BRACKETT FIELD	626	0.7
12011	FXE	FL	BROWARD	FORT LAUDERDALE EXECUTI	615	0.7
06073	MYF	CA	SAN DIEGO	MONTGOMERY FIELD	604	0.7
34027	MMU	NJ	MORRIS	MORRISTOWN MUNI	601	0.7
13063	ATL	GA	FULTON	THE WILLIAM B HARTSFIEL	593	0.7
12061	VRB	FL	INDIAN RIVER	VERO BEACH MUNI	593	0.7
51107	IAD	DC	LOUDOUN	WASHINGTON DULLES INTER	586	0.6
48439	FTW	TX	TARRANT	FORT WORTH MEACHAM INTL	582	0.6
06085	RHV	CA	SANTA CLARA	REID-HILLVIEW OF SANTA	580	0.6
34003	TEB	NJ	BERGEN	TETERBORO	579	0.6
04013	CHD	AZ	MARICOPA	CHANDLER MUNI	566	0.6
13089	PDK	GA	DE KALB	DEKALB-PEACHTREE	554	0.6
06001	LVK	CA	ALAMEDA	LIVERMORE MUNI	551	0.6
41067	HIO	OR	WASHINGTON	PORTLAND-HILLSBORO	549	0.6
12011	PMP	FL	BROWARD	POMPANO BEACH AIRPARK	545	0.6
06001	OAK	CA	ALAMEDA	METROPOLITAN OAKLAND IN	542	0.6
25017	BED	MA	MIDDLESEX	LAURENCE G HANSCOM FLD	533	0.6
49035	SLC	UT	SALT LAKE	SALT LAKE CITY INTL	529	0.6
12035	XFL	FL	FLAGLER	FLAGLER COUNTY	525	0.6
06085	PAO	CA	SANTA CLARA	PALO ALTO ARPT OF SANTA	524	0.6
42003	PIT	PA	ALLEGHENY	PITTSBURGH INTERNATIONA	521	0.6
36103	FRG	NY	SUFFOLK	REPUBLIC	519	0.6
06073	CRQ	CA	SAN DIEGO	MC CLELLAN-PALOMAR	515	0.6
12095	ORL	FL	ORANGE	EXECUTIVE	514	0.6
12127	OMN	FL	VOLUSIA	ORMOND BEACH MUNI	500	0.6
06111	CMA	CA	VENTURA	CAMARILLO	497	0.5
32003	VGT	NV	CLARK	NORTH LAS VEGAS	496	0.5
48201	DWH	TX	HARRIS	DAVID WAYNE HOOKS MEMOR	491	0.5
53061	PAE	WA	SNOHOMISH	SNOHOMISH COUNTY (PAINE	487	0.5
12111	FPR	FL	ST LUCIE	ST LUCIE COUNTY INTL	485	0.5
36103	ISP	NY	SUFFOLK	LONG ISLAND MAC ARTHUR	485	0.5
12009	MLB	FL	BREVARD	MELBOURNE INTL	479	0.5
04013	SDL	AZ	MARICOPA	SCOTTSDALE	474	0.5
37119	CLT	NC	MECKLENBURG	CHARLOTTE/DOUGLAS INTL	471	0.5
12009	TIX	FL	BREVARD	SPACE COAST REGIONAL	466	0.5
36119	HPN	NY	WESTCHESTER	WESTCHESTER COUNTY	459	0.5
08059	BJC	CO	BROOMFIELD	JEFFCO	456	0.5
39049	CMH	OH	FRANKLIN	PORT COLUMBUS INTL	456	0.5
12103	PIE	FL	PINELLAS	ST PETERSBURG-CLEARWATE	455	0.5
27053	FCM	MN	HENNEPIN	FLYING CLOUD	453	0.5
06073	SEE	CA	SAN DIEGO	GILLESPIE FIELD	453	0.5
29189	SUS	MO	ST LOUIS	SPIRIT OF ST LOUIS	451	0.5
20173	ICT	KS	SEDGWICK	WICHITA MID-CONTINENT	449	0.5
25025	BOS	MA	SUFFOLK	GENERAL EDWARD LAWRENCE	448	0.5

04013	PHX	AZ	MARICOPA	PHOENIX SKY HARBOR INTL	448	0.5
48029	SSF	TX	BEXAR	STINSON MUNI	444	0.5
04019	TUS	AZ	PIMA	TUCSON INTL	441	0.5
17043	DPA	IL	DU PAGE	DUPAGE	441	0.5
08041	COS	CO	EL PASO	CITY OF COLORADO SPRING	440	0.5
12115	VNC	FL	SARASOTA	VENICE MUNI	434	0.5
02020	MRI	AK	ANCHORAGE	MERRILL FIELD	430	0.5
12025	TMB	FL	MIAMI-DADE	KENDALL-TAMIAMI EXECUTI	425	0.5
17163	CPS	IL	ST CLAIR	ST LOUIS DOWNTOWN	424	0.5
42045	PHL	PA	PHILADELPHIA	PHILADELPHIA INTL	423	0.5
48121	52F	TX	DENTON	NORTHWEST REGIONAL	417	0.5
06081	SQL	CA	SAN MATEO	SAN CARLOS	417	0.5
25027	FIT	MA	WORCESTER	FITCHBURG MUNI	412	0.5
17031	PWK	IL	COOK	PALWAUKEE MUNI	406	0.4
04013	IWA	AZ	MARICOPA	WILLIAMS GATEWAY	404	0.4
06037	LAX	CA	LOS ANGELES	LOS ANGELES INTL	402	0.4
06037	TOA	CA	LOS ANGELES	ZAMPERINI FIELD	398	0.4
48113	ADS	TX	DALLAS	ADDISON	398	0.4
48201	IAH	TX	HARRIS	GEORGE BUSH INTERCONTIN	397	0.4
06071	CNO	CA	SAN BERNARDINO	CHINO	396	0.4
27123	STP	MN	RAMSEY	ST PAUL DOWNTOWN HOLMAN	395	0.4
24021	FDK	MD	FREDERICK	FREDERICK MUNI	392	0.4
48029	SAT	TX	BEXAR	SAN ANTONIO INTL	392	0.4
51700	PHF	VA	NEWPORT NEWS	NEWPORT NEWS/WILLIAMSBU	391	0.4
06029	BFL	CA	KERN	MEADOWS FIELD	390	0.4
48439	GKY	TX	TARRANT	ARLINGTON MUNI	387	0.4
24013	DMW	MD	CARROLL	CARROLL COUNTY REGIONAL	386	0.4
42101	PNE	PA	PHILADELPHIA	NORTHEAST PHILADELPHIA	385	0.4
34013	CDW	NJ	ESSEX	ESSEX COUNTY	384	0.4
01083	DCU	AL	LIMESTONE	PRYOR FIELD RGNL	384	0.4
48113	DAL	TX	DALLAS	DALLAS LOVE FIELD	383	0.4
12031	CRG	FL	DUVAL	CRAIG MUNI	383	0.4
06001	HWD	CA	ALAMEDA	HAYWARD EXECUTIVE	382	0.4
12011	HWO	FL	BROWARD	NORTH PERRY	382	0.4
06037	EMT	CA	LOS ANGELES	EL MONTE	381	0.4
49005	LGU	UT	CACHE	LOGAN-CACHE	380	0.4
35045	FMN	NM	SAN JUAN	FOUR CORNERS REGIONAL	380	0.4
12081	SRQ	FL	SARASOTA	SARASOTA/BRADENTON INTL	379	0.4
48085	TKI	TX	COLLIN	MC KINNEY MUNI	376	0.4
06083	SBA	CA	SANTA BARBARA	SANTA BARBARA MUNI	375	0.4
48423	TYR	TX	SMITH	TYLER POUNDS RGNL	375	0.4
32003	LAS	NV	CLARK	MC CARRAN INTL	374	0.4
37183	RDU	NC	WAKE	RALEIGH-DURHAM INTL	373	0.4
04019	RYN	AZ	PIMA	RYAN FIELD	370	0.4
06037	SMO	CA	LOS ANGELES	SANTA MONICA MUNI	369	0.4
12099	LNA	FL	PALM BEACH	PALM BEACH COUNTY PARK	368	0.4
53033	S50	WA	KING	AUBURN MUNI	366	0.4
42011	RDG	PA	BERKS	READING REGIONAL/CARL A	365	0.4

12109	SGJ	FL	ST JOHNS	ST AUGUSTINE	362	0.4
12097	ISM	FL	OSCEOLA	KISSIMMEE GATEWAY	360	0.4
12105	LAL	FL	POLK	LAKELAND LINDER RGNL	358	0.4
06013	CCR	CA	CONTRA COSTA	BUCHANAN FIELD	357	0.4
55079	MKE	WI	MILWAUKEE	GENERAL MITCHELL INTERN	354	0.4
25019	ACK	MA	NANTUCKET	NANTUCKET MEMORIAL	354	0.4
53033	SEA	WA	KING	SEATTLE-TACOMA INTL	354	0.4
24031	GAI	MD	MONTGOMERY	MONTGOMERY COUNTY AIRPA	353	0.4
12127	EVB	FL	VOLUSIA	NEW SMYRNA BEACH MUNI	353	0.4
26163	DTW	MI	WAYNE	DETROIT METROPOLITAN WA	352	0.4
27053	MSP	MN	HENNEPIN	MINNEAPOLIS-ST PAUL INT	352	0.4
41051	PDX	OR	MULTNOMAH	PORTLAND INTL	352	0.4
47157	MEM	TN	SHELBY	MEMPHIS INTL	352	0.4
53061	S43	WA	SNOHOMISH	HARVEY FIELD	350	0.4
29189	STL	MO	ST LOUIS CITY	LAMBERT-ST LOUIS INTL	350	0.4
08031	DEN	CO	DENVER	DENVER INTL	347	0.4
04013	GYR	AZ	MARICOPA	PHOENIX GOODYEAR	346	0.4
53061	AWO	WA	SNOHOMISH	ARLINGTON MUNI	344	0.4
15003	JRF	HI	HONOLULU	KALAELOA (JOHN RODGERS	343	0.4
51683	HEF	VA	PRINCE WILLIAM	MANASSAS REGIONAL/HARRY	340	0.4
48201	HOU	TX	HARRIS	WILLIAM P HOBBY	340	0.4
06041	DVO	CA	MARIN	GNOSS FIELD	339	0.4
36103	HWV	NY	SUFFOLK	BROOKHAVEN	339	0.4
27003	ANE	MN	ANOKA	ANOKA COUNTY-BLAINE ARP	339	0.4
12099	PBI	FL	PALM BEACH	PALM BEACH INTL	339	0.4
36027	POU	NY	DUTCHESS	DUTCHESS COUNTY	338	0.4
12021	APF	FL	COLLIER	NAPLES MUNI	337	0.4
06055	APC	CA	NAPA	NAPA COUNTY	334	0.4
17089	ARR	IL	KANE	AURORA MUNI	331	0.4
17077	MDH	IL	JACKSON	SOUTHERN ILLINOIS	330	0.4
39061	LUK	OH	HAMILTON	CINCINNATI MUNI AIRPORT	330	0.4
13121	FTY	GA	FULTON	FULTON COUNTY AIRPORT-B	329	0.4
06019	FAT	CA	FRESNO	FRESNO YOSEMITE INTERNA	328	0.4
27053	MIC	MN	HENNEPIN	CRYSTAL	328	0.4
18157	LAF	IN	TIPPECANOE	PURDUE UNIVERSITY	328	0.4
25001	PVC	MA	BARNSTABLE	PROVINCETOWN MUNI	328	0.4
13067	RYY	GA	COBB	COBB COUNTY-MC COLLUM F	327	0.4
08123	GXY	CO	WELD	GREELEY-WELD COUNTY	323	0.4
12025	MIA	FL	MIAMI-DADE	MIAMI INTL	322	0.4
42007	BVI	PA	BEAVER	BEAVER COUNTY	322	0.4
06073	SDM	CA	SAN DIEGO	BROWN FIELD MUNI	319	0.4
17019	CMI	IL	CHAMPAIGN	UNIVERSITY OF ILLINOIS-	317	0.3
06087	WVI	CA	SANTA CRUZ	WATSONVILLE MUNI	316	0.3
12025	OPF	FL	MIAMI-DADE	OPA LOCKA	315	0.3
04013	BXK	AZ	MARICOPA	BUCKEYE MUNI	314	0.3
06071	L67	CA	SAN BERNARDINO	RIALTO MUNI /MIRO FLD/	314	0.3
12085	SUA	FL	MARTIN	WITHAM FIELD	311	0.3
02020	ANC	AK	ANCHORAGE	TED STEVENS ANCHORAGE I	311	0.3

12011	FLL	FL	BROWARD	FORT LAUDERDALE/HOLLYWO	310	0.3
33011	ASH	NH	HILLSBOROUGH	BOIRE FIELD	308	0.3
2130	5KE	AK	KETCHIKAN	KETCHICAN HARBOR	307	0.3
10003	ILG	DE	NEW CASTLE	NEW CASTLE COUNTY	306	0.3
36081	LGA	NY	QUEENS	LA GUARDIA	305	0.3
36071	MGJ	NY	ORANGE	ORANGE COUNTY	305	0.3
35001	AEG	NM	BERNALILLO	DOUBLE EAGLE II	305	0.3
34013	EWR	NJ	ESSEX	NEWARK LIBERTY INTL	304	0.3
26049	FNT	MI	GENESEE	BISHOP INTERNATIONAL	303	0.3
21111	LOU	KY	JEFFERSON	BOWMAN FIELD	302	0.3
48201	T41	TX	HARRIS	LA PORTE MUNI	302	0.3
29047	MKC	MO	CLAY	CHARLES B. WHEELER DOWN	301	0.3
15003	HNL	HI	HONOLULU	HONOLULU INTL	301	0.3
48491	GTU	TX	WILLIAMSON	GEORGETOWN MUNI	301	0.3
42077	ABE	PA	LEHIGH	LEHIGH VALLEY INTERNATI	300	0.3
26025	BTL	MI	CALHOUN	W K KELLOGG	300	0.3
16027	EUL	ID	CANYON	CALDWELL INDUSTRIAL	300	0.3
28033	OLV	MS	DE SOTO	OLIVE BRANCH	300	0.3
42003	AGC	PA	ALLEGHENY	ALLEGHENY COUNTY	299	0.3
35001	ABQ	NM	BERNALILLO	ALBUQUERQUE INTL SUNPOR	297	0.3
24005	MTN	MD	BALTIMORE	MARTIN STATE	296	0.3
47009	TYS	TN	BLOUNT	MC GHEE TYSON	295	0.3
05119	LIT	AR	PULASKI	ADAMS FIELD	294	0.3
25001	HYA	MA	BARNSTABLE	BARNSTABLE MUNI-BOARDMA	292	0.3
39049	OSU	OH	FRANKLIN	OHIO STATE UNIVERSITY	291	0.3
06097	STS	CA	SONOMA	SONOMA COUNTY	287	0.3
09001	DXR	CT	FAIRFIELD	DANBURY MUNI	287	0.3
55139	OSH	WI	WINNEBAGO	WITTMAN REGIONAL	286	0.3
48453	AUS	TX	TRAVIS	AUSTIN-BERGSTROM INTL	286	0.3
12009	COI	FL	BREVARD	MERRITT ISLAND	285	0.3
48121	DTO	TX	DENTON	DENTON MUNI	285	0.3
34021	TTN	NJ	MERCER	TRENTON MERCER	284	0.3
53033	RNT	WA	KING	RENTON MUNI	283	0.3
26163	YIP	MI	WAYNE	WILLOW RUN	283	0.3
36071	SWF	NY	ORANGE	STEWART INT'L	282	0.3
40027	OUN	OK	CLEVELAND	UNIVERSITY OF OKLAHOMA	281	0.3
42071	LNS	PA	LANCASTER	LANCASTER	278	0.3
04013	GEU	AZ	MARICOPA	GLENDALE MUNICIPAL	278	0.3
39043	SKY	OH	ERIE	GRIFFING SANDUSKY	278	0.3
06067	SAC	CA	SACRAMENTO	SACRAMENTO EXECUTIVE	278	0.3
12069	LEE	FL	LAKE	LEESBURG REGIONAL	277	0.3
48113	HQZ	TX	DALLAS	MESQUITE METRO	276	0.3
06037	WHP	CA	LOS ANGELES	WHITEMAN	275	0.3
36055	ROC	NY	MONROE	GREATER ROCHESTER INTER	274	0.3
39035	CLE	OH	CUYAHOGA	CLEVELAND-HOPKINS INTL	273	0.3
13135	LZU	GA	GWINNETT	GWINNETT COUNTY - BRISC	272	0.3
53035	PWT	WA	KITSAP	BREMERTON NATIONAL	269	0.3
06073	RNM	CA	SAN DIEGO	RAMONA	268	0.3

25023	PYM	MA	PLYMOUTH	PLYMOUTH MUNI	265	0.3
16001	BOI	ID	ADA	BOISE AIR TERMINAL/GOWE	264	0.3
08001	FTG	CO	ADAMS	FRONT RANGE	264	0.3
55025	MSN	WI	DANE	DANE COUNTY REGIONAL-TR	263	0.3
51107	JYO	VA	LOUDOUN	LEESBURG EXECUTIVE	263	0.3
05093	HKA	AR	MISSISSIPPI	BLYTHEVILLE MUNI	263	0.3
48055	HYI	TX	CALDWELL	SAN MARCOS MUNI	262	0.3
06065	RAL	CA	RIVERSIDE	RIVERSIDE MUNI	262	0.3
22071	NEW	LA	ORLEANS	LAKEFRONT	262	0.3
06037	BUR	CA	LOS ANGELES	BURBANK-GLENDALE-PASADE	262	0.3
36001	ALB	NY	ALBANY	ALBANY INTL	261	0.3
53053	PLU	WA	PIERCE	PIERCE COUNTY - THUN FI	260	0.3
47037	BNA	TN	DAVIDSON	NASHVILLE INTL	260	0.3
18097	IND	IN	MARION	INDIANAPOLIS INTL	259	0.3
39153	CAK	OH	SUMMIT	AKRON-CANTON REGIONAL	258	0.3
72127	SIG	PR		FERNANDO LUIS RIBAS DOM	257	0.3
29095	LXT	MO	JACKSON	LEE'S SUMMIT MUNICIPAL	257	0.3
48167	GLS	TX	GALVESTON	SCHOLES INTL AT GALVEST	256	0.3
01073	BHM	AL	JEFFERSON	BIRMINGHAM INTL	256	0.3
47065	CHA	TN	HAMILTON	LOVELL FIELD	255	0.3
06095	VCB	CA	SOLANO	NUT TREE	255	0.3
06059	FUL	CA	ORANGE	FULLERTON MUNI	254	0.3
09003	HFD	CT	HARTFORD	HARTFORD-BRAINARD -72.65	253	0.3
26055	TVC	MI	GRAND TRAVERSE	CHERRY CAPITAL	252	0.3
26081	GRR	MI	KENT	GERALD R. FORD INTERNAT	252	0.3
08069	FNL	CO	LARIMER	FORT COLLINS-LOVELAND M	252	0.3
15009	OGG	HI	MAUI	KAHULUI	251	0.3
06065	HMT	CA	RIVERSIDE	HEMET-RYAN	251	0.3
08013	LMO	CO	BOULDER	VANCE BRAND	251	0.3
48201	EFD	TX	HARRIS	ELLINGTON FIELD	251	0.3
17097	UGN	IL	LAKE	WAUKEGAN REGIONAL	250	0.3
06079	SBP	CA	SAN LUIS OBISPO	SAN LUIS COUNTY REGIONA	249	0.3
12071	FMY	FL	LEE	PAGE FIELD	249	0.3
53033	S36	WA	KING	CREST AIRPARK	249	0.3
41003	CVO	OR	BENTON	CORVALLIS MUNI	247	0.3
01073	EKY	AL	JEFFERSON	BESSEMER	247	0.3
09001	BDR	CT	FAIRFIELD	IGOR I SIKORSKY MEMORIA	246	0.3
06111	SZP	CA	VENTURA	SANTA PAULA	244	0.3
40143	TUL	OK	TULSA	TULSA INTL	243	0.3
72031	SJU	PR		LUIS MUNOZ MARIN INTL	243	0.3
12103	SPG	FL	PINELLAS	ALBERT WHITTED	242	0.3
06085	SJC	CA	SANTA CLARA	NORMAN Y. MINETA SAN JO	240	0.3
17197	LOT	IL	WILL	LEWIS UNIVERSITY	239	0.3
20091	OJC	KS	JOHNSON	JOHNSON COUNTY EXECUTIV	239	0.3
48113	RBD	TX	DALLAS	DALLAS EXECUTIVE	239	0.3
22033	BTR	LA	EAST BATON ROUGE	BATON ROUGE METROPOLITA	239	0.3
06065	PSP	CA	RIVERSIDE	PALM SPRINGS INTERNATIO	239	0.3
06019	FCH	CA	FRESNO	FRESNO-CHANDLER DOWNTOW	239	0.3

12057	VDF	FL	HILLSBOROUGH	VANDENBERG	237	0.3
39035	BKL	OH	CUYAHOGA	BURKE LAKEFRONT	237	0.3
48157	SGR	TX	FORT BEND	SUGAR LAND RGNL	237	0.3
25009	LWM	MA	ESSEX	LAWRENCE MUNI	236	0.3
39169	BJJ	OH	WAYNE	WAYNE COUNTY	236	0.3
45063	CAE	SC	LEXINGTON	COLUMBIA METROPOLITAN	235	0.3
55133	UES	WI	WAUKESHA	WAUKESHA COUNTY	234	0.3
26161	ARB	MI	WASHTENAW	ANN ARBOR MUNI	233	0.3
12095	MCO	FL	ORANGE	ORLANDO INTL	233	0.3
09001	OXC	CT	NEW HAVEN	WATERBURY-OXFORD	232	0.3
02110	JNU	AK	JUNEAU	JUNEAU INTL	232	0.3
51770	ROA	VA	ROANOKE	ROANOKE REGIONAL/WOODRU	232	0.3
13051	SAV	GA	CHATHAM	SAVANNAH/HILTON HEAD IN	231	0.3
31055	OMA	NE	DOUGLAS	EPPLEY AIRFIELD	231	0.3
01045	71J	AL	DALE	BLACKWELL FIELD	230	0.3
45013	HXD	SC	BEAUFORT	HILTON HEAD	230	0.3
26077	AZO	MI	KALAMAZOO	KALAMAZOO/BATTLE CREEK	230	0.3
16055	COE	ID	KOOTENAI	COEUR D'ALENE AIR TERM	229	0.3
25009	BVY	MA	ESSEX	BEVERLY MUNI	228	0.3
49049	PVU	UT	UTAH	PROVO MUNI	228	0.3
49057	OGD	UT	WEBER	OGDEN-HINCKLEY	227	0.3
39173	TDZ	OH	WOOD	METCALF FIELD	227	0.3
53021	PSC	WA	FRANKLIN	TRI-CITIES	227	0.3
12057	TPA	FL	HILLSBOROUGH	TAMPA INTL	226	0.2
24003	BWI	MD	ANNE ARUNDEL	BALTIMORE-WASHINGTON IN	226	0.2
06099	MOD	CA	STANISLAUS	MODESTO CITY-CO-HARRY S	226	0.2
36037	GVQ	NY	GENESEE	GENESEE COUNTY	225	0.2
12099	BCT	FL	PALM BEACH	BOCA RATON	225	0.2
30111	BIL	MT	YELLOWSTONE	BILLINGS LOGAN INTL	225	0.2
12033	PNS	FL	ESCAMBIA	PENSACOLA REGIONAL	225	0.2
16027	S67	ID	CANYON	NAMPA MUNI	224	0.2
08077	GJT	CO	MESA	WALKER FIELD	224	0.2
48039	LVJ	TX	BRAZORIA	CLOVER FIELD	224	0.2
37081	GSO	NC	GUILFORD	PIEDMONT TRIAD INTERNAT	223	0.2
36067	SYR	NY	ONONDAGA	SYRACUSE HANCOCK INTL	222	0.2
17031	MDW	IL	COOK	CHICAGO MIDWAY INTL	222	0.2
06071	CCB	CA	SAN BERNARDINO	CABLE	221	0.2
55117	SBM	WI	SHEBOYGAN	SHEBOYGAN COUNTY MEMORI	221	0.2
20169	SLN	KS	SALINE	SALINA MUNI	221	0.2
39113	MGY	OH	MONTGOMERY	DAYTON-WRIGHT BROTHERS	219	0.2
39113	I73	OH	MONTGOMERY	MORAINE AIR PARK	219	0.2
50007	BTV	VT	CHITTENDEN	BURLINGTON INTL	218	0.2
46099	FSD	SD	MINNEHAHA	JOE FOSS FIELD	217	0.2
18163	EVV	IN	VANDERBURGH	EVANSVILLE REGIONAL	217	0.2
24041	ESN	MD	TALBOT	EASTON/NEWNAM FIELD	216	0.2
06111	OXR	CA	VENTURA	OXNARD	215	0.2
44003	PVD	RI	KENT	THEODORE FRANCIS GREEN	215	0.2
55105	JVL	WI	ROCK	ROCK CO	214	0.2

55059	ENW	WI	KENOSHA	KENOSHA REGIONAL	214	0.2
48439	GPM	TX	TARRANT	GRAND PRAIRIE MUNI	214	0.2
22061	RSN	LA	LINCOLN	RUSTON RGNL	213	0.2
32031	RNO	NV	WASHOE	RENO/TAHOE INTERNATIONA	213	0.2
41039	EUG	OR	LANE	MAHLON SWEET FIELD	213	0.2
42079	AVP	PA	LUZERNE	WILKES-BARRE/SCRANTON I	212	0.2
53053	TIW	WA	PIERCE	TACOMA NARROWS	212	0.2
06053	MRY	CA	MONTEREY	MONTEREY PENINSULA	211	0.2
23005	PWM	ME	CUMBERLAND	PORTLAND INTL JETPORT	210	0.2
51087	RIC	VA	HENRICO	RICHMOND INTERNATIONAL	210	0.2
04005	GCN	AZ	COCONINO	GRAND CANYON NATIONAL P	210	0.2
32510	CXP	NV	CARSON CITY	CARSON	210	0.2
12073	TLH	FL	LEON	TALLAHASSEE REGIONAL	210	0.2
33013	CON	NH	MERRIMACK	CONCORD MUNI	208	0.2
47093	DKX	TN	KNOX	KNOXVILLE DOWNTOWN ISLA	207	0.2
48201	IWS	TX	HARRIS	WEST HOUSTON	207	0.2
40109	PWA	OK	OKLAHOMA	WILEY POST	207	0.2
48183	GGG	TX	GREGG	EAST TEXAS RGNL	206	0.2
22103	ASD	LA	ST TAMMANY	SLIDELL	206	0.2
06109	O22	CA	TUOLUMNE	COLUMBIA	206	0.2
35049	SAF	NM	SANTA FE	SANTA FE MUNI	206	0.2
47163	TRI	TN	SULLIVAN	TRI-CITIES RGNL TN/VA	205	0.2
53067	OLM	WA	THURSTON	OLYMPIA	205	0.2
15003	HDH	HI	HONOLULU	DILLINGHAM AIRFIELD	205	0.2
18019	JVY	IN	CLARK	CLARK COUNTY	204	0.2
26121	MKG	MI	MUSKEGON	MUSKEGON COUNTY	204	0.2
51710	ORF	VA	NORFOLK	NORFOLK INTL	203	0.2
45045	GMU	SC	GREENVILLE	GREENVILLE DOWNTOWN	202	0.2
15001	KOA	HI	HAWAII	KONA INTL AT KEAHOLE	202	0.2
18167	HUF	IN	VIGO	TERRE HAUTE INTERNATION	202	0.2
06077	SCK	CA	SAN JOAQUIN	STOCKTON METROPOLITAN	201	0.2
22109	HUM	LA	TERREBONNE	HOUMA-TERREBONNE	201	0.2
01003	JKA	AL	BALDWIN	JACK EDWARDS	200	0.2
26037	LAN	MI	CLINTON	CAPITAL CITY	200	0.2
21067	LEX	KY	FAYETTE	BLUE GRASS	200	0.2
32005	MEV	NV	DOUGLAS	MINDEN-TAHOE	200	0.2
06037	HHR	CA	LOS ANGELES	JACK NORTHROP FIELD/HAW	199	0.2
06037	WJF	CA	LOS ANGELES	GENERAL WM J FOX AIRFIE	199	0.2
17119	ALN	IL	MADISON	ST LOUIS REGIONAL	198	0.2
25021	OWD	MA	NORFOLK	NORWOOD MEMORIAL	198	0.2
02090	FAI	AK	FAIRBANKS	FAIRBANKS INTL	197	0.2
55079	MWC	WI	MILWAUKEE	LAWRENCE J TIMMERMAN	197	0.2
39049	TZR	OH	FRANKLIN	BOLTON FIELD	197	0.2
41047	UAO	OR	MARION	AURORA STATE	197	0.2
39103	1G5	OH	MEDINA	MEDINA MUNICIPAL	196	0.2
22045	ARA	LA	IBERIA	ACADIANA REGIONAL	196	0.2
12031	HEG	FL	DUVAL	HERLONG	196	0.2
42017	DYL	PA	BUCKS	DOYLESTOWN	195	0.2

12127	DED	FL	VOLUSIA	DELAND MUNI-SIDNEY H TA	195	0.2
25023	GHG	MA	PLYMOUTH	MARSHFIELD	195	0.2
36103	FOK	NY	SUFFOLK	THE FRANCIS S GABRESKI	194	0.2
32003	HND	NV	CLARK	HENDERSON	194	0.2
29077	SGF	MO	GREENE	SPRINGFIELD-BRANSON REG	193	0.2
31109	LNK	NE	LANCASTER	LINCOLN MUNI	191	0.2
36029	BUF	NY	ERIE	BUFFALO NIAGARA INTL	191	0.2
51041	FCI	VA	CHESTERFIELD	CHESTERFIELD COUNTY	190	0.2
06065	TRM	CA	RIVERSIDE	DESERT RESORTS REGIONAL	190	0.2
19153	DSM	IA	POLK	DES MOINES INTL	189	0.2
40109	OKC	OK	OKLAHOMA	WILL ROGERS WORLD	189	0.2
12105	GIF	FL	POLK	WINTER HAVEN'S GILBERT	188	0.2
06065	AJO	CA	RIVERSIDE	CORONA MUNI	188	0.2
06073	OKB	CA	SAN DIEGO	OCEANSIDE MUNI	188	0.2
26163	1D2	MI	WAYNE	CANTON-PLYMOUTH-METTETA	188	0.2
18003	FWA	IN	ALLEN	FORT WAYNE INTERNATIONA	187	0.2
22055	LFT	LA	LAFAYETTE	LAFAYETTE REGIONAL	187	0.2
54039	CRW	WV	KANAWHA	YEAGER	187	0.2
41009	SPB	OR	COLUMBIA	SCAPPOOSE INDUSTRIAL AI	187	0.2
12055	SEF	FL	HIGHLANDS	SEBRING REGIONAL	186	0.2
06083	SMX	CA	SANTA BARBARA	SANTA MARIA PUB/CAPT G	186	0.2
06033	1O2	CA	LAKE	LAMPSON FIELD	186	0.2
39113	DAY	OH	MONTGOMERY	JAMES M COX DAYTON INTL	185	0.2
51003	CHO	VA	ALBEMARLE	CHARLOTTESVILLE-ALBEMAR	185	0.2
51550	PVG	VA	CHESAPEAKE	HAMPTON ROADS EXECUTIVE	185	0.2
21111	SDF	KY	JEFFERSON	LOUISVILLE INTL-STANDIF	185	0.2
27141	STC	MN	SHERBURNE	ST CLOUD REGIONAL	184	0.2
48157	AXH	TX	FORT BEND	HOUSTON-SOUTHWEST	184	0.2
28067	PIB	MS	JONES	HATTIESBURG-LAUREL REGI	183	0.2
06081	SFO	CA	SAN MATEO	SAN FRANCISCO INTERNATI	183	0.2
08013	BDU	CO	BOULDER	BOULDER MUNI	183	0.2
06061	LHM	CA	PLACER	LINCOLN REGIONAL/KARL H	183	0.2
38017	FAR	ND	CASS	HECTOR INTL	183	0.2
48339	CXO	TX	MONTGOMERY	MONTGOMERY COUNTY	182	0.2
12015	PGD	FL	CHARLOTTE	CHARLOTTE COUNTY	182	0.2
39153	1G3	OH	SUMMIT	KENT STATE UNIV	182	0.2
45051	HYW	SC	HORRY	CONWAY-HORRY COUNTY	181	0.2
53075	PUW	WA	WHITMAN	PULLMAN/MOSCOW REGIONAL	181	0.2
78030	STT	VI	-VIRGIN ISLANDS-	CYRIL E KING	181	0.2
22113	0R3	LA	VERMILION	ABBEVILLE CHRIS CRUSTA	181	0.2
41071	MMV	OR	YAMHILL	MC MINNVILLE MUNI	181	0.2
08123	EIK	CO	WELD	ERIE MUNICIPAL	180	0.2
39063	5G7	OH	HANCOCK	BLUFFTON	180	0.2
31055	MLE	NE	DOUGLAS	MILLARD	180	0.2
37129	ILM	NC	NEW HANOVER	WILMINGTON INTL	180	0.2
53025	MWH	WA	GRANT	GRANT COUNTY INTL	179	0.2
47149	MQY	TN	RUTHERFORD	SMYRNA	179	0.2
04019	AVQ	AZ	PIMA	MARANA NORTHWEST REGION	178	0.2

25005	1B9	MA	BRISTOL	MANSFIELD MUNI	177	0.2
12025	X51	FL	MIAMI-DADE	HOMESTEAD GENERAL AVIAT	177	0.2
27013	MKT	MN	BLUE EARTH	MANKATO REGIONAL	177	0.2
36105	N82	NY	SULLIVAN	WURTSBORO-SULLIVAN COUN	176	0.2
49035	U42	UT	SALT LAKE	SALT LAKE CITY MUNI 2	176	0.2
48439	AFW	TX	TARRANT	FORT WORTH ALLIANCE	176	0.2
06053	SNS	CA	MONTEREY	SALINAS MUNI	175	0.2
45073	CEU	SC	OCONEE	OCONEE COUNTY REGIONAL	175	0.2
13059	AHN	GA	CLARKE	ATHENS/BEN EPPS	175	0.2
20091	IXD	KS	JOHNSON	NEW CENTURY AIRCENTER	175	0.2
41051	TTD	OR	MULTNOMAH	PORTLAND-TROUTDALE	175	0.2
04021	CGZ	AZ	PINAL	CASA GRANDE MUNI	175	0.2
05001	SGT	AR	PRAIRIE	STUTTGART MUNI	174	0.2
27163	21D	MN	WASHINGTON	LAKE ELMO	174	0.2
02020	LHD	AK	ANCHORAGE	LAKE HOOD	174	0.2
53073	BLI	WA	WHATCOM	BELLINGHAM INTL	174	0.2
12001	GNV	FL	ALACHUA	GAINESVILLE RGNL	174	0.2
15007	LIH	HI	KAUAI	LIHUE	174	0.2
20177	TOP	KS	SHAWNEE	PHILIP BILLARD MUNI	173	0.2
06089	RDD	CA	SHASTA	REDDING MUNI	173	0.2
12087	EYW	FL	MONROE	KEY WEST INTL	173	0.2
28047	GPT	MS	HARRISON	GULFPORT-BILOXI INTL	173	0.2
06061	AUN	CA	PLACER	AUBURN MUNI	173	0.2
45019	CHS	SC	CHARLESTON	CHARLESTON AFB/INTL	172	0.2
26099	UIZ	MI	MACOMB	BERZ-MACOMB	171	0.2
39113	3I7	OH	MONTGOMERY	PHILLIPSBURG	171	0.2
05063	BVX	AR	INDEPENDENCE	BATESVILLE REGIONAL	171	0.2
06065	F70	CA	RIVERSIDE	FRENCH VALLEY	171	0.2
15001	ITO	HI	HAWAII	HILO INTERNATIONAL	171	0.2
26163	DET	MI	WAYNE	DETROIT CITY	171	0.2
45003	AIK	SC	AIKEN	AIKEN MUNI	170	0.2
55039	FLD	WI	FOND DU LAC	FOND DU LAC COUNTY	170	0.2
12033	82J	FL	ESCAMBIA	FERGUSON	170	0.2
40071	PNC	OK	KAY	PONCA CITY MUNI	169	0.2
17201	RFD	IL	WINNEBAGO	GREATER ROCKFORD	169	0.2
01121	ASN	AL	TALLADEGA	TALLADEGA MUNI	169	0.2
39035	CGF	OH	CUYAHOGA	CUYAHOGA COUNTY	168	0.2
26093	OZW	MI	LIVINGSTON	LIVINGSTON COUNTY	168	0.2
06025	IPL	CA	IMPERIAL	IMPERIAL COUNTY	168	0.2
12005	PFN	FL	BAY	PANAMA CITY-BAY CO INTL	167	0.2
26037	4D0	MI	CLINTON	ABRAMS MUNI	167	0.2
34001	ACY	NJ	ATLANTIC	ATLANTIC CITY INTERNATI	167	0.2
08101	PUB	CO	PUEBLO	PUEBLO MEMORIAL	167	0.2
39095	TOL	OH	LUCAS	TOLEDO EXPRESS	166	0.2
17007	C77	IL	BOONE	POPLAR GROVE	166	0.2
47037	JWN	TN	DAVIDSON	JOHN C TUNE	166	0.2
26075	JXN	MI	JACKSON	JACKSON COUNTY-REYNOLDS	165	0.2
23031	SFM	ME	YORK	SANFORD REGIONAL	165	0.2

37025	JQF	NC	CABARRUS	CONCORD REGIONAL	165	0.2
53063	SFF	WA	SPOKANE	FELTS FIELD	165	0.2
12091	DTS	FL	OKALOOSA	DESTIN-FORT WALTON BEAC	165	0.2
42073	UCP	PA	LAWRENCE	NEW CASTLE MUNI	164	0.2
48439	FWS	TX	TARRANT	FORT WORTH SPINKS	164	0.2
09009	HVN	CT	NEW HAVEN	TWEED-NEW HAVEN	164	0.2
10003	EVY	DE	NEW CASTLE	SUMMIT	164	0.2
06023	EKA	CA	HUMBOLDT	MURRAY FIELD	164	0.2
21059	OWB	KY	DAVIESS	OWENSBORO-DAVIESS COUNT	164	0.2
53009	CLM	WA	CLALLAM	WILLIAM R FAIRCHILD INT	163	0.2
02110	5Z1	AK	JUNEAU	JUNEAU HARBOR	163	0.2
17031	IGQ	IL	COOK	LANSING MUNI	163	0.2
27037	LVN	MN	DAKOTA	AIRLAKE	163	0.2
01081	AUO	AL	LEE	AUBURN-OPELIKA ROBERT G	163	0.2
35013	LRU	NM	DONA ANA	LAS CRUCES INTERNATIONA	163	0.2
53057	74S	WA	SKAGIT	ANACORTES	163	0.2
02170	PAQ	AK	MATA-SUS BOROUGH	PALMER MUNI	163	0.2
45077	LQK	SC	PICKENS	PICKENS COUNTY	163	0.2
37021	AVL	NC	BUNCOMBE	ASHEVILLE REGIONAL	163	0.2
45083	SPA	SC	SPARTANBURG	SPARTANBURG DOWNTOWN ME	162	0.2
48039	LBX	TX	BRAZORIA	BRAZORIA COUNTY	162	0.2
06067	MHR	CA	SACRAMENTO	SACRAMENTO MATHER	162	0.2
09011	GON	CT	NEW LONDON	GROTON-NEW LONDON	162	0.2
17167	SPI	IL	SANGAMON	CAPITAL	162	0.2
48141	ELP	TX	EL PASO	EL PASO INTL	161	0.2
06017	PVF	CA	EL DORADO	PLACERVILLE	161	0.2
05007	ROG	AR	BENTON	ROGERS MUNICIPAL-CARTER	161	0.2
25005	EWB	MA	BRISTOL	NEW BEDFORD REGIONAL	160	0.2
02290	GAL	AK	YUKON-KOYUKUK	EDWARD G. PITKA SR	159	0.2
37067	INT	NC	FORSYTH	SMITH REYNOLDS	158	0.2
28081	TUP	MS	LEE	TUPELO RGNL	158	0.2
09003	BDL	CT	HARTFORD	BRADLEY INTL	157	0.2
36065	UCA	NY	ONEIDA	ONEIDA COUNTY	157	0.2
42019	BTP	PA	BUTLER	BUTLER COUNTY/K W SCHOL	157	0.2
53063	GEG	WA	SPOKANE	SPOKANE INTL	156	0.2
05017	M32	AR	CHICOT	LAKE VILLAGE MUNI	156	0.2
42027	UNV	PA	CENTRE	UNIVERSITY PARK	155	0.2
18141	SBN	IN	ST JOSEPH	SOUTH BEND REGIONAL	155	0.2
24003	ANP	MD	ANNE ARUNDEL	LEE	153	0.2
21227	BWG	KY	WARREN	BOWLING GREEN-WARREN CO	153	0.2
12087	MTH	FL	MONROE	THE FLORIDA KEYS MARATH	153	0.2
39155	YNG	OH	TRUMBULL	YOUNGSTOWN-WARREN REGIO	153	0.2
51069	OKV	VA	FREDERICK	WINCHESTER REGIONAL	153	0.2
39017	HAO	OH	BUTLER	BUTLER CO RGNL	152	0.2
44007	SFZ	RI	PROVIDENCE	NORTH CENTRAL STATE	152	0.2
12113	2R4	FL	SANTA ROSA	PETER PRINCE FIELD	152	0.2
06113	2Q3	CA	YOLO	YOLO COUNTY-DAVIS/WOODL	152	0.2
06081	HAF	CA	SAN MATEO	HALF MOON BAY	151	0.2

39147	16G	OH	SENECA	SENECA COUNTY	151	0.2
06037	CPM	CA	LOS ANGELES	COMPTON/WOODLEY	151	0.2
53055	FHR	WA	SAN JUAN	FRIDAY HARBOR	151	0.2
55101	RAC	WI	RACINE	JOHN H BATTEN	151	0.2
36093	SCH	NY	SCHENECTADY	SCHENECTADY COUNTY	151	0.2
48027	TPL	TX	BELL	DRAUGHON-MILLER CENTRAL	151	0.2
24033	W00	MD	PRINCE GEORGES	FREEWAY	150	0.2
42133	CXY	PA	YORK	CAPITAL CITY	150	0.2
20079	EWK	KS	HARVEY	NEWTON-CITY-COUNTY	150	0.2
55009	GRB	WI	BROWN	AUSTIN STRAUBEL INTERNA	150	0.2
51085	OFP	VA	HANOVER	HANOVER COUNTY MUNI	150	0.2
02070	DLG	AK	BRISTOL BAY	DILLINGHAM	150	0.2
17143	PIA	IL	PEORIA	GREATER PEORIA REGIONAL	150	0.2
23019	OLD	ME	PENOBSCOT	DEWITT FLD,OLD TOWN MUN	149	0.2
39085	LNN	OH	LAKE	WILLOUGHBY LOST NATION	149	0.2
06115	MYV	CA	YUBA	YUBA COUNTY	149	0.2
09003	4B8	CT	HARTFORD	ROBERTSON FIELD	149	0.2
28071	UOX	MS	LAFAYETTE	UNIVERSITY-OXFORD	149	0.2
05119	ORK	AR	PULASKI	NORTH LITTLE ROCK MUNI	148	0.2
23001	LEW	ME	ANDROSCOGGIN	AUBURN/LEWISTON MUNI	148	0.2
19113	CID	IA	LINN	THE EASTERN IOWA	147	0.2
26041	ESC	MI	DELTA	DELTA COUNTY	146	0.2
28011	RNV	MS	BOLIVAR	CLEVELAND MUNI	145	0.2
25007	MVY	MA	DUKES	MARTHAS VINEYARD	144	0.2
34025	BLM	NJ	MONMOUTH	MONMOUTH EXECUTIVE	144	0.2
36063	0G0	NY	NIAGARA	NORTH BUFFALO SUBURBAN	143	0.2
17091	IKK	IL	KANKAKEE	GREATER KANKAKEE	143	0.2
55055	RYV	WI	JEFFERSON	WATERTOWN MUNI	143	0.2
18057	UMP	IN	HAMILTON	INDIANAPOLIS METROPOLIT	143	0.2
33009	LEB	NH	GRAFTON	LEBANON MUNI	143	0.2
26163	ONZ	MI	WAYNE	GROSSE ILE MUNI	143	0.2
27137	DLH	MN	ST LOUIS	DULUTH INTL	143	0.2
41029	MFR	OR	JACKSON	ROGUE VALLEY INTERNATIO	142	0.2
13015	VPC	GA	BARTOW	CARTERSVILLE	142	0.2
30063	MSO	MT	MISSOULA	MISSOULA INTERNATIONAL	141	0.2
27109	RST	MN	OLMSTED	ROCHESTER INTERNATIONAL	141	0.2
02020	BCV	AK	ANCHORAGE	BIRCHWOOD	141	0.2
48309	ACT	TX	MC LENNAN	WACO REGIONAL	140	0.2
06077	TCY	CA	SAN JOAQUIN	TRACY MUNI	139	0.2
53057	BVS	WA	SKAGIT	SKAGIT REGIONAL	138	0.2
46103	RAP	SD	PENNINGTON	RAPID CITY REGIONAL	138	0.2
25005	TAN	MA	BRISTOL	TAUNTON MUNI	138	0.2
45051	CRE	SC	HORRY	GRAND STRAND	138	0.2
36029	9G0	NY	ERIE	BUFFALO AIRFIELD	138	0.2
45079	CUB	SC	RICHLAND	COLUMBIA OWENS DOWNTOWN	138	0.2
34005	N14	NJ	BURLINGTON	FLYING W	138	0.2
06085	E16	CA	SANTA CLARA	SOUTH COUNTY ARPT OF SA	138	0.2
23019	BGR	ME	PENOBSCOT	BANGOR INTL	138	0.2

25027	ORH	MA	WORCESTER	WORCESTER REGIONAL	138	0.2
26125	VLL	MI	OAKLAND	OAKLAND/TROY	138	0.2
55101	BUU	WI	RACINE	BURLINGTON MUNI	138	0.2
16013	SUN	ID	BLAINE	FRIEDMAN MEMORIAL	138	0.2
17101	LWV	IL	LAWRENCE	LAWRENCEVILLE-VINCENNES	137	0.2
39157	PHD	OH	TUSCARAWAS	HARRY CLEVER FIELD	137	0.2
41009	1S4	OK	DEWEY	SEILING	137	0.2
25013	BAF	MA	HAMPDEN	BARNES MUNI	137	0.2
30031	BZN	MT	GALLATIN	GALLATIN FIELD	137	0.2
48303	LBB	TX	LUBBOCK	LUBBOCK INTL	136	0.2
17161	MLI	IL	ROCK ISLAND	QUAD CITY INTL	136	0.2
48355	CRP	TX	NUECES	CORPUS CHRISTI INTL	136	0.1
32031	4SD	NV	WASHOE	RENO/STEAD	136	0.1
37179	EQY	NC	UNION	MONROE REGIONAL	136	0.1
34027	N07	NJ	MORRIS	LINCOLN PARK	136	0.1
28089	MBO	MS	MADISON	BRUCE CAMPBELL FIELD	135	0.1
42077	1N9	PA	LEHIGH	ALLENTOWN QUEEN CITY MU	135	0.1
26005	BIV	MI	ALLEGAN	TULIP CITY	134	0.1
34005	VAY	NJ	BURLINGTON	SOUTH JERSEY REGIONAL	134	0.1
04005	FLG	AZ	COCONINO	FLAGSTAFF PULLIAM	134	0.1
06067	SMF	CA	SACRAMENTO	SACRAMENTO INTERNATIONA	134	0.1
36015	ELM	NY	CHEMUNG	ELMIRA/CORNING REGIONAL	133	0.1
22017	SHV	LA	CADDO	SHREVEPORT REGIONAL	133	0.1
48215	MFE	TX	HIDALGO	MC ALLEN MILLER INTL	133	0.1
45007	AND	SC	ANDERSON	ANDERSON RGNL	133	0.1
01089	HSV	AL	MADISON	HUNTSVILLE INTL-CARL T	133	0.1
48041	CLL	TX	BRAZOS	EASTERWOOD FIELD	133	0.1
33011	MHT	NH	HILLSBOROUGH	MANCHESTER	133	0.1
19061	DBQ	IA	DUBUQUE	DUBUQUE REGIONAL	133	0.1
17113	BMI	IL	MC LEAN	CENTRAL IL REGL ARPT AT	132	0.1
40119	SWO	OK	PAYNE	STILLWATER RGNL	132	0.1
24033	VKX	MD	PRINCE GEORGES	POTOMAC AIRFIELD	132	0.1
24037	2W6	MD	ST MARYS	CAPT WALTER FRANCIS DUK	132	0.1
06071	ONT	CA	SAN BERNARDINO	ONTARIO INTL	132	0.1
55133	02C	WI	WAUKESHA	CAPITOL	132	0.1
39023	SGH	OH	CLARK	SPRINGFIELD-BECKLEY MUN	132	0.1
08067	DRO	CO	LA PLATA	DURANGO-LA PLATA COUNTY	132	0.1
28049	HKS	MS	HINDS	HAWKINS FIELD	132	0.1
36061	6N5	NY	NEW YORK	EAST 34TH STREET	131	0.1
45045	GYH	SC	GREENVILLE	DONALDSON CENTER	130	0.1
47149	MBT	TN	RUTHERFORD	MURFREESBORO MUNI	130	0.1
37139	ECG	NC	PASQUOTANK	ELIZABETH CITY CG AIR S	130	0.1
48441	ABI	TX	TAYLOR	ABILENE REGIONAL	130	0.1
06069	CVH	CA	SAN BENITO	HOLLISTER MUNI	129	0.1
06107	PTV	CA	TULARE	PORTERVILLE MUNI	129	0.1
06109	E45	CA	TUOLUMNE	PINE MOUNTAIN LAKE	129	0.1
37049	EWN	NC	CRAVEN	CRAVEN COUNTY REGIONAL	129	0.1
12091	CEW	FL	OKALOOSA	BOB SIKES	129	0.1

26145	HYX	MI	SAGINAW	SAGINAW COUNTY H.W. BRO	129	0.1
25027	3B0	MA	WORCESTER	SOUTHBRIDGE MUNI	128	0.1
05001	5M1	AR	ARKANSAS	DE WITT MUNI	128	0.1
27037	SGS	MN	DAKOTA	SOUTH ST PAUL MUNI-RICH	128	0.1
36029	9G3	NY	ERIE	AKRON	128	0.1
55127	57C	WI	WALWORTH	EAST TROY MUNI	127	0.1
41017	RDM	OR	DESCHUTES	ROBERTS FIELD	127	0.1
53017	EAT	WA	DOUGLAS	PANGBORN MEMORIAL	127	0.1
12103	CLW	FL	PINELLAS	CLEARWATER AIR PARK	127	0.1
06073	SAN	CA	SAN DIEGO	SAN DIEGO INTL-LINDBERG	127	0.1
06039	MAE	CA	MADERA	MADERA MUNI	127	0.1
42133	THV	PA	YORK	YORK	127	0.1
20155	HUT	KS	RENO	HUTCHINSON MUNI	127	0.1
45083	GSP	SC	GREENVILLE	GREENVILLE-SPARTANBURG	126	0.1
06097	O69	CA	SONOMA	PETALUMA MUNI	126	0.1
40113	OWP	OK	OSAGE	WILLIAM R. POGUE MUNI	126	0.1
17197	1C5	IL	WILL	CLOW INTL	126	0.1
45013	ARW	SC	BEAUFORT	BEAUFORT COUNTY	126	0.1
37071	AKH	NC	GASTON	GASTONIA MUNI	126	0.1
06025	BWC	CA	IMPERIAL	BRAWLEY MUNI	126	0.1
06057	GOO	CA	NEVADA	NEVADA COUNTY AIR PARK	126	0.1
06067	L36	CA	SACRAMENTO	RIO LINDA	126	0.1
02290	BTT	AK	YUKON-KOYUKUK	BETTLES	126	0.1
42029	MQS	PA	CHESTER	CHESTER COUNTY G O CARL	125	0.1
12101	ZPH	FL	PASCO	ZEPHYRHILLS MUNI	125	0.1
12031	JAX	FL	DUVAL	JACKSONVILLE INTL	125	0.1
37069	LHZ	NC	FRANKLIN	FRANKLIN COUNTY	125	0.1
30049	HLN	MT	LEWIS AND CLARK	HELENA REGIONAL	125	0.1
48007	RKP	TX	ARANSAS	ARANSAS CO	125	0.1
17199	MWA	IL	WILLIAMSON	WILLIAMSON COUNTY REGIO	125	0.1
55009	ATW	WI	OUTAGAMIE	OUTAGAMIE COUNTY REGION	125	0.1
05143	ASG	AR	WASHINGTON	SPRINGDALE MUNI	124	0.1
12057	TPF	FL	HILLSBOROUGH	PETER O KNIGHT	123	0.1
37051	FAY	NC	CUMBERLAND	FAYETTEVILLE REGIONAL/G	123	0.1
42029	OQN	PA	CHESTER	BRANDYWINE	123	0.1
55017	EAU	WI	CHIPPEWA	CHIPPEWA VALLEY REGIONA	123	0.1
22015	DTN	LA	BOSSIER	SHREVEPORT DOWNTOWN	123	0.1
39005	3G4	OH	ASHLAND	ASHLAND COUNTY	122	0.1
01101	MGM	AL	MONTGOMERY	MONTGOMERY RGNL (DANNEL	122	0.1
12053	BKV	FL	HERNANDO	HERNANDO COUNTY	122	0.1
26145	MBS	MI	SAGINAW	MBS INTL	121	0.1
47155	GKT	TN	SEVIER	GATLINBURG-PIGEON FORGE	121	0.1
53077	YKM	WA	YAKIMA	YAKIMA AIR TERMINAL/MCA	121	0.1
17033	RSV	IL	CRAWFORD	ROBINSON MUNI	121	0.1
13113	FFC	GA	FAYETTE	PEACHTREE CITY-FALCON F	121	0.1
36027	44N	NY	DUTCHESS	SKY ACRES	121	0.1
05085	4M3	AR	LONOKE	CARLISLE MUNI	121	0.1
35009	CVN	NM	CURRY	CLOVIS MUNI	121	0.1

36007	CZG	NY	BROOME	TRI-CITIES	121	0.1
24003	FME	MD	ANNE ARUNDEL	TIPTON	121	0.1
05067	M19	AR	JACKSON	NEWPORT MUNI	121	0.1
18089	GYY	IN	LAKE	GARY/CHICAGO	120	0.1
42049	ERI	PA	ERIE	ERIE INTL/TOM RIDGE FIE	120	0.1
36051	DSV	NY	LIVINGSTON	DANSVILLE MUNI	120	0.1
17115	DEC	IL	MACON	DECATUR	120	0.1
34035	39N	NJ	SOMERSET	PRINCETON	120	0.1
40013	DUA	OK	BRYAN	EAKER FIELD	119	0.1
51031	LYH	VA	CAMPBELL	LYNCHBURG REGIONAL/PRES	119	0.1
04015	IGM	AZ	MOHAVE	KINGMAN	119	0.1
25003	AQW	MA	BERKSHIRE	HARRIMAN-AND-WEST	119	0.1
23013	RKD	ME	KNOX	KNOX COUNTY REGIONAL	119	0.1
25003	PSF	MA	BERKSHIRE	PITTSFIELD MUNI	119	0.1
01045	DHN	AL	DALE	DOTHAN RGNL	118	0.1
08103	4V0	CO	RIO BLANCO	RANGELY	118	0.1
24045	SBY	MD	WICOMICO	SALISBURY-OCEAN CITY WI	118	0.1
26103	SAW	MI	MARQUETTE	SAWYER INTERNATIONAL	117	0.1
12089	55J	FL	NASSAU	FERNANDINA BEACH MUNI	117	0.1
53011	VUO	WA	CLARK	PEARSON FIELD	117	0.1
04027	NYL	AZ	YUMA	YUMA MCAS/YUMA INTL	117	0.1
24043	HGR	MD	WASHINGTON	HAGERSTOWN REGIONAL-RIC	117	0.1
48479	LRD	TX	WEBB	LAREDO INTL	116	0.1
39141	RZT	OH	ROSS	ROSS COUNTY	116	0.1
22051	MSY	LA	JEFFERSON	LOUIS ARMSTRONG NEW ORL	116	0.1
12083	OCF	FL	MARION	OCALA INTL-JIM TAYLOR F	116	0.1
05095	M36	AR	MONROE	FRANK FEDERER MEMORIAL	116	0.1
37055	MQI	NC	DARE	DARE COUNTY REGIONAL	116	0.1
24035	W29	MD	QUEEN ANNES	BAY BRIDGE	116	0.1
04015	HII	AZ	MOHAVE	LAKE HAVASU CITY	115	0.1
37023	HKY	NC	BURKE	HICKORY REGIONAL	115	0.1
45019	JZI	SC	CHARLESTON	CHARLESTON EXECUTIVE	115	0.1
01003	4R4	AL	BALDWIN	H L SONNY CALLAHAN	115	0.1
01125	TCL	AL	TUSCALOOSA	TUSCALOOSA MUNI	115	0.1
26115	DUH	MI	MONROE	TOLEDO SUBURBAN	115	0.1
47063	MOR	TN	HAMBLEN	MOORE-MURRELL	114	0.1
47147	M91	TN	ROBERTSON	SPRINGFIELD ROBERTSON C	114	0.1
41047	SLE	OR	MARION	MCNARY FLD	113	0.1
06029	MIT	CA	KERN	SHAFTER-MINTER FIELD	113	0.1
53031	0S9	WA	JEFFERSON	JEFFERSON COUNTY INTL	113	0.1
55069	AUW	WI	MARATHON	WAUSAU DOWNTOWN	113	0.1
39139	MFD	OH	RICHLAND	MANSFIELD LAHM REGIONAL	112	0.1
26029	CVX	MI	CHARLEVOIX	CHARLEVOIX MUNI	112	0.1
05115	RUE	AR	POPE	RUSSELLVILLE RGNL	112	0.1
28045	HSA	MS	HANCOCK	STENNIS INTL	112	0.1
26091	ADG	MI	LENAWEE	LENAWEE COUNTY	112	0.1
48265	ERV	TX	KERR	KERRVILLE MUNI/LOUIS SC	111	0.1
78010	STX	VI	-VIRGIN ISLANDS-	HENRY E ROHLSEN	111	0.1

17111	10C	IL	MC HENRY	GALT FIELD	111	0.1
33005	EEN	NH	CHESHIRE	DILLANT-HOPKINS	110	0.1
16085	MYL	ID	VALLEY	MC CALL	110	0.1
13185	VLD	GA	LOWNDES	VALDOSTA RGNL	110	0.1
39019	TSO	OH	CARROLL	CARROLL COUNTY-TOLSON	110	0.1
41007	AST	OR	CLATSOP	ASTORIA REGIONAL	110	0.1
53055	ORS	WA	SAN JUAN	ORCAS ISLAND	110	0.1
45051	MYR	SC	HORRY	MYRTLE BEACH INTL	110	0.1
22073	MLU	LA	OUACHITA	MONROE REGIONAL	110	0.1
42043	MDT	PA	DAUPHIN	HARRISBURG INTERNATIONA	109	0.1
01033	MSL	AL	COLBERT	NORTHWEST ALABAMA RGNL	109	0.1
19153	IKV	IA	POLK	ANKENY REGIONAL	109	0.1
42091	PTW	PA	MONTGOMERY	POTTSTOWN LIMERICK	109	0.1
48135	ODO	TX	ECTOR	ODESSA-SCHLEMEYER FIELD	108	0.1
53041	CLS	WA	LEWIS	CHEHALIS-CENTRALIA	108	0.1
29183	3SQ	MO	ST CHARLES	ST CHARLES	108	0.1
47059	GCY	TN	GREENE	GREENEVILLE-GREENE COUN	108	0.1
06045	UKI	CA	MENDOCINO	UKIAH MUNI	108	0.1
29183	SET	MO	ST CHARLES	ST CHARLES COUNTY SMART	108	0.1
16069	LWS	ID	NEZ PERCE	LEWISTON-NEZ PERCE COUN	108	0.1
42129	FWQ	PA	WESTMORELAND	ROSTRAVER	108	0.1
35013	5T6	NM	DONA ANA	DONA ANA COUNTY AT SANT	107	0.1
06007	CIC	CA	BUTTE	CHICO MUNI	107	0.1
34011	MIV	NJ	CUMBERLAND	MILLVILLE MUNI	107	0.1
45063	6J0	SC	LEXINGTON	CORPORATE	107	0.1
13245	DNL	GA	RICHMOND	DANIEL FIELD	107	0.1
39101	MNN	OH	MARION	MARION MUNI	107	0.1
26147	PHN	MI	ST CLAIR	ST CLAIR COUNTY INTL	107	0.1
12105	BOW	FL	POLK	BARTOW MUNI	107	0.1
34039	LDJ	NJ	UNION	LINDEN	107	0.1
36109	ITH	NY	TOMPKINS	ITHACA TOMPKINS REGIONA	106	0.1
48245	BPT	TX	JEFFERSON	SOUTHEAST TEXAS REGIONA	106	0.1
18077	IMS	IN	JEFFERSON	MADISON MUNI	106	0.1
10005	GED	DE	SUSSEX	SUSSEX COUNTY	106	0.1
30029	GPI	MT	FLATHEAD	GLACIER PARK INTL	106	0.1
42091	N10	PA	MONTGOMERY	PERKIOMEN VALLEY	106	0.1
54061	MGW	WV	MONONGALIA	MORGANTOWN MUNI-WALTER	106	0.1
38015	BIS	ND	BURLEIGH	BISMARCK MUNI	106	0.1
55101	C89	WI	RACINE	SYLVANIA	105	0.1
13127	SSI	GA	GLYNN	MALCOLM MC KINNON	105	0.1
13013	WDR	GA	BARROW	WINDER-BARROW	105	0.1
54033	CKB	WV	HARRISON	HARRISON/MARION REGIONA	105	0.1
48451	SJT	TX	TOM GREEN	SAN ANGELO REGIONAL/MAT	105	0.1
51013	DCA	DC	ARLINGTON	RONALD REAGAN WASHINGTO	105	0.1
13215	CSG	GA	MUSCOGEE	COLUMBUS METROPOLITAN	105	0.1
13217	9A1	GA	NEWTON	COVINGTON MUNI	105	0.1
27071	INL	MN	KOOCHICHING	FALLS INTL	105	0.1
48113	LNC	TX	DALLAS	LANCASTER	105	0.1

17063	C09	IL	GRUNDY	MORRIS MUNI - JAMES R.	105	0.1
55025	C29	WI	DANE	MOREY	104	0.1
06071	REI	CA	SAN BERNARDINO	REDLANDS MUNI	104	0.1
20175	LBL	KS	SEWARD	LIBERAL MUNI	104	0.1
18177	RID	IN	WAYNE	RICHMOND MUNI	104	0.1
46013	ABR	SD	BROWN	ABERDEEN REGIONAL	104	0.1
18105	BMG	IN	MONROE	MONROE COUNTY	104	0.1
51550	CPK	VA	CHESAPEAKE	CHESAPEAKE REGIONAL	103	0.1
37031	MRH	NC	CARTERET	MICHAEL J. SMITH FIELD	103	0.1
55109	RNH	WI	ST CROIX	NEW RICHMOND MUNI	103	0.1
06065	UDD	CA	RIVERSIDE	BERMUDA DUNES	103	0.1
53071	ALW	WA	WALLA WALLA	WALLA WALLA REGIONAL	103	0.1
47125	CKV	TN	MONTGOMERY	OUTLAW FIELD	103	0.1
01109	TOI	AL	PIKE	TROY MUNI	103	0.1
08041	00V	CO	EL PASO	MEADOW LAKE	103	0.1
06023	ACV	CA	HUMBOLDT	ARCATA	103	0.1
25015	7B2	MA	HAMPSHIRE	NORTHAMPTON	102	0.1
34035	SMQ	NJ	SOMERSET	SOMERSET	102	0.1
42035	LHV	PA	CLINTON	WILLIAM T. PIPER MEMORI	102	0.1
48309	PWG	TX	MC LENNAN	MC GREGOR EXECUTIVE	102	0.1
16065	RXE	ID	MADISON	REXBURG-MADISON COUNTY	102	0.1
30013	GTF	MT	CASCADE	GREAT FALLS INTL	102	0.1
06077	1O3	CA	SAN JOAQUIN	LODI	102	0.1
36081	JFK	NY	QUEENS	JOHN F KENNEDY INTL	101	0.1
54003	MRB	WV	BERKELEY	EASTERN WV REGIONAL/SHE	101	0.1
42125	AFJ	PA	WASHINGTON	WASHINGTON COUNTY	101	0.1
48181	GYI	TX	GRAYSON	GRAYSON COUNTY	101	0.1
39009	UNI	OH	ATHENS	OHIO UNIVERSITY SNYDER	101	0.1
39103	3G3	OH	MEDINA	WADSWORTH MUNI	101	0.1
36033	SLK	NY	FRANKLIN	ADIRONDACK REGIONAL	100	0.1
06029	L45	CA	KERN	BAKERSFIELD MUNICIPAL	100	0.1
39017	MWO	OH	BUTLER	HOOK FIELD MUNI	100	0.1
06101	O52	CA	SUTTER	SUTTER COUNTY	100	0.1
06053	OAR	CA	MONTEREY	MARINA MUNICIPAL	100	0.1
12009	X21	FL	BREVARD	ARTHUR DUNN AIR PARK	100	0.1
17103	C73	IL	LEE	DIXON MUNI-CHARLES R. W	100	0.1
04017	SOW	AZ	NAVAJO	SHOW LOW MUNI	100	0.1
22079	AEX	LA	RAPIDES	ALEXANDRIA INTL	100	0.1
45047	GRD	SC	GREENWOOD	GREENWOOD COUNTY	100	0.1
45055	CDN	SC	KERSHAW	WOODWARD FIELD	100	0.1
08097	ASE	CO	PITKIN	ASPEN-PITKIN CO/SARDY F	100	0.1
42129	LBE	PA	WESTMORELAND	ARNOLD PALMER REGIONAL	100	0.1
48375	AMA	TX	POTTER	AMARILLO INTL	99	0.1
42029	N57	PA	CHESTER	NEW GARDEN	99	0.1
12107	28J	FL	PUTNAM	KAY LARKIN	99	0.1
47157	2M8	TN	SHELBY	CHARLES W. BAKER	99	0.1
04025	SEZ	AZ	YAVAPAI	SEDONA	99	0.1
01051	08A	AL	ELMORE	WETUMPKA MUNI	99	0.1

36061	6N4	NY	NEW YORK	PAN AM METROPORT	99	0.1
39041	DLZ	OH	DELAWARE	DELAWARE MUNI	99	0.1
29097	JLN	MO	JASPER	JOPLIN REGIONAL	98	0.1
01097	MOB	AL	MOBILE	MOBILE REGIONAL	98	0.1
47157	M01	TN	SHELBY	GENERAL DEWITT SPAIN	98	0.1
18097	EYE	IN	MARION	EAGLE CREEK AIRPARK	98	0.1
48329	MAF	TX	MIDLAND	MIDLAND INTERNATIONAL	98	0.1
39057	I19	OH	GREENE	GREENE COUNTY-LEWIS A.	98	0.1
19013	ALO	IA	BLACK HAWK	WATERLOO MUNI	97	0.1
45085	SMS	SC	SUMTER	SUMTER MUNI	97	0.1
53015	KLS	WA	COWLITZ	KELSO-LONGVIEW	97	0.1
39097	UYF	OH	MADISON	MADISON COUNTY	97	0.1
36091	5B2	NY	SARATOGA	SARATOGA COUNTY	97	0.1
37001	BUY	NC	ALAMANCE	BURLINGTON-ALAMANCE RGN	97	0.1
06083	LPC	CA	SANTA BARBARA	LOMPOC	97	0.1
22105	HDC	LA	TANGIPAHOA	HAMMOND MUNI	96	0.1
01097	BFM	AL	MOBILE	MOBILE DOWNTOWN	96	0.1
20173	AAO	KS	SEDGWICK	COLONEL JAMES JABARA	96	0.1
26021	BEH	MI	BERRIEN	SOUTHWEST MICHIGAN REGI	96	0.1
29165	MCI	MO	PLATTE	KANSAS CITY INTL	96	0.1
25011	ORE	MA	FRANKLIN	ORANGE MUNI	96	0.1
48397	F46	TX	ROCKWALL	ROCKWALL MUNI	95	0.1
37053	FFA	NC	DARE	FIRST FLIGHT	95	0.1
56025	CPR	WY	NATRONA	NATRONA COUNTY INTL	95	0.1
28015	GWO	MS	CARROLL	GREENWOOD-LEFLORE	95	0.1
12057	PCM	FL	HILLSBOROUGH	PLANT CITY MUNI	95	0.1
45015	MKS	SC	BERKELEY	BERKELEY COUNTY	95	0.1
01043	3A1	AL	CULLMAN	FOLSOM FIELD	95	0.1
26099	D98	MI	MACOMB	ROMEO STATE	95	0.1
06029	IYK	CA	KERN	INYOKERN	95	0.1
25017	6B6	MA	MIDDLESEX	MINUTE MAN AIR FIELD	94	0.1
04005	PGA	AZ	COCONINO	PAGE MUNI	94	0.1
36007	BGM	NY	BROOME	BINGHAMTON REGIONAL/EDW	94	0.1
34015	17N	NJ	GLOUCESTER	CROSS KEYS	94	0.1
45091	UZA	SC	YORK	ROCK HILL/YORK CO/BRYAN	94	0.1
06071	APV	CA	SAN BERNARDINO	APPLE VALLEY	94	0.1
34035	47N	NJ	SOMERSET	CENTRAL JERSEY REGIONAL	94	0.1
55131	ETB	WI	WASHINGTON	WEST BEND MUNI	94	0.1
15009	MKK	HI	MAUI	MOLOKAI	94	0.1
55063	LSE	WI	LA CROSSE	LA CROSSE MUNI	94	0.1
24033	W32	MD	PRINCE GEORGES	WASHINGTON EXECUTIVE/HY	94	0.1
12061	X26	FL	INDIAN RIVER	SEBASTIAN MUNI	94	0.1
41011	OTH	OR	COOS	NORTH BEND MUNI	93	0.1
39087	HTW	OH	LAWRENCE	LAWRENCE COUNTY AIRPARK	93	0.1
05005	BPK	AR	BAXTER	BAXTER COUNTY REGIONAL	93	0.1
36013	DKK	NY	CHAUTAUQUA	CHAUTAUQUA COUNTY/DUNKI	93	0.1
41053	7S5	OR	POLK	INDEPENDENCE STATE	93	0.1
40019	ADM	OK	CARTER	ARDMORE MUNI	93	0.1

49053	SGU	UT	WASHINGTON	ST GEORGE MUNI	93	0.1
41017	BDN	OR	DESCHUTES	BEND MUNI	93	0.1
49051	36U	UT	WASATCH	HEBER CITY MUNI - RUSS	93	0.1
48005	LFK	TX	ANGELINA	ANGELINA COUNTY	93	0.1
02188	OTZ	AK	KOBUK	RALPH WIEN MEMORIAL	93	0.1
17037	DKB	IL	DE KALB	DE KALB TAYLOR MUNI	93	0.1
54099	HTS	WV	WAYNE	TRI-STATE/MILTON J. FER	93	0.1
06057	TRK	CA	NEVADA	TRUCKEE-TAHOE	92	0.1
39143	14G	OH	SANDUSKY	FREMONT	92	0.1
55097	STE	WI	PORTAGE	STEVENS POINT MUNI	92	0.1
18039	EKM	IN	ELKHART	ELKHART MUNI	92	0.1
12017	CGC	FL	CITRUS	CRYSTAL RIVER	91	0.1
24047	OXB	MD	WORCESTER	OCEAN CITY MUNI	91	0.1
72037	CPX	PR		BENJAMIN RIVERA NORIEGA	91	0.1
36103	HTO	NY	SUFFOLK	EAST HAMPTON	91	0.1
05019	M89	AR	CLARK	DEXTER B FLORENCE MEMOR	91	0.1
28121	JAN	MS	RANKIN	JACKSON INTERNATIONAL	91	0.1
17043	06C	IL	DU PAGE	SCHAUMBURG REGIONAL	91	0.1
13139	GVL	GA	HALL	LEE GILMER MEMORIAL	91	0.1
06017	O61	CA	EL DORADO	CAMERON AIRPARK	91	0.1
20015	3AU	KS	BUTLER	AUGUSTA MUNI	90	0.1
06029	L71	CA	KERN	CALIFORNIA CITY MUNI	90	0.1
34019	N51	NJ	HUNTERDON	SOLBERG-HUNTERDON	90	0.1
06007	OVE	CA	BUTTE	OROVILLE MUNI	90	0.1
06067	F72	CA	SACRAMENTO	FRANKLIN FIELD	90	0.1
26097	83D	MI	MACKINAC	MACKINAC COUNTY	90	0.1
13095	ABY	GA	DOUGHERTY	SOUTHWEST GEORGIA REGIO	90	0.1
05091	TXK	AR	MILLER	TEXARKANA REGIONAL-WEBB	90	0.1
42031	AXQ	PA	CLARION	CLARION COUNTY	90	0.1
05021	4M9	AR	CLAY	CORNING MUNI	90	0.1
48189	PVW	TX	HALE	HALE COUNTY	90	0.1
18039	GSH	IN	ELKHART	GOSHEN MUNI	90	0.1
16077	PIH	ID	POWER	POCATELLO REGIONAL	89	0.1
12099	F45	FL	PALM BEACH	NORTH PALM BEACH COUNTY	89	0.1
20041	K78	KS	DICKINSON	ABILENE MUNI	89	0.1
42079	WBW	PA	LUZERNE	WILKES-BARRE WYOMING VA	89	0.1
05069	PBF	AR	JEFFERSON	GRIDER FIELD	89	0.1
24025	0W3	MD	HARFORD	HARFORD COUNTY	89	0.1
34029	MJX	NJ	OCEAN	ROBERT J. MILLER AIR PA	89	0.1
33001	LCI	NH	BELKNAP	LACONIA MUNI	89	0.1
46083	Y14	SD	LINCOLN	MARV SKIE-LINCOLN COUNT	89	0.1
23009	BHB	ME	HANCOCK	HANCOCK COUNTY-BAR HARB	88	0.1
12021	IMM	FL	COLLIER	IMMOKALEE	88	0.1
37147	PGV	NC	PITT	PITT-GREENVILLE	88	0.1
42091	LOM	PA	MONTGOMERY	WINGS FIELD	88	0.1
18035	MIE	IN	DELAWARE	DELAWARE COUNTY - JOHNS	88	0.1
18089	05C	IN	LAKE	GRIFFITH-MERRILLVILLE	88	0.1
42017	N70	PA	BUCKS	PENNRIDGE	88	0.1

36113	GFL	NY	WARREN	FLOYD BENNETT MEMORIAL	88	0.1
36111	N45	NY	ULSTER	KOBELT	88	0.1
06089	O85	CA	SHASTA	BENTON FIELD	88	0.1
06095	O88	CA	SOLANO	RIO VISTA MUNI	88	0.1
27113	TVF	MN	PENNINGTON	THIEF RIVER FALLS REGIO	88	0.1
18005	BAK	IN	BARTHOLOMEW	COLUMBUS MUNI	88	0.1
53055	S31	WA	SAN JUAN	LOPEZ ISLAND	88	0.1
41005	4S9	OR	CLACKAMAS	PORTLAND-MULINO	88	0.1
06089	O89	CA	SHASTA	FALL RIVER MILLS	87	0.1
42013	AOO	PA	BLAIR	ALTOONA-BLAIR COUNTY	87	0.1
55085	RHI	WI	ONEIDA	RHINELANDER-ONEIDA COUN	87	0.1
36045	ART	NY	JEFFERSON	WATERTOWN INTERNATIONAL	87	0.1
48139	JWY	TX	ELLIS	Midlothian/Waxahachie M	87	0.1
27035	BRD	MN	CROW WING	BRAINERD LAKES RGNL	87	0.1
55029	SUE	WI	DOOR	DOOR COUNTY CHERRYLAND	87	0.1
54069	HLG	WV	BROOKE	WHEELING OHIO CO	87	0.1
48329	MDD	TX	MIDLAND	MIDLAND AIRPARK	87	0.1
01047	SEM	AL	DALLAS	CRAIG FIELD	87	0.1
13045	CTJ	GA	CARROLL	WEST GEORGIA RGNL - O V	87	0.1
50001	6B0	VT	ADDISON	MIDDLEBURY STATE	87	0.1
39129	CYO	OH	PICKAWAY	PICKAWAY COUNTY MEMORIA	87	0.1
13245	AGS	GA	RICHMOND	AUGUSTA RGNL AT BUSH FI	87	0.1
23031	B19	ME	YORK	BIDDEFORD MUNI	86	0.1
51061	HWY	VA	FAUQUIER	WARRENTON-FAUQUIER	86	0.1
38093	JMS	ND	STUTSMAN	JAMESTOWN REGIONAL	86	0.1
54107	PKB	WV	WOOD	WOOD COUNTY AIRPORT GIL	86	0.1
06113	EDU	CA	YOLO	UNIVERSITY	86	0.1
48215	T65	TX	HIDALGO	MID VALLEY	86	0.1
26033	CIU	MI	CHIPPEWA	CHIPPEWA COUNTY INTL	86	0.1
35005	ROW	NM	CHAVES	ROSWELL INDUSTRIAL AIR	86	0.1
34037	FWN	NJ	SUSSEX	SUSSEX	86	0.1
19033	MCW	IA	CERRO GORDO	MASON CITY MUNI	86	0.1
17111	3CK	IL	MC HENRY	LAKE IN THE HILLS	85	0.1
05107	HEE	AR	PHILLIPS	THOMPSON-ROBBINS	85	0.1
05001	M73	AR	ARKANSAS	ALMYRA MUNI	85	0.1
30029	S27	MT	FLATHEAD	KALISPELL CITY	85	0.1
47019	0A9	TN	CARTER	ELIZABETHTON MUNI	85	0.1
18127	VPZ	IN	PORTER	PORTER COUNTY MUNI	85	0.1
51121	BCB	VA	MONTGOMERY	VIRGINIA TECH	85	0.1
40083	GOK	OK	LOGAN	GUTHRIE MUNI	85	0.1
47165	M33	TN	SUMNER	SUMNER COUNTY REGIONAL	85	0.1
18059	MQJ	IN	HANCOCK	MOUNT COMFORT	84	0.1
01115	PLR	AL	ST CLAIR	ST CLAIR COUNTY	84	0.1
37145	TDF	NC	PERSON	PERSON COUNTY	84	0.1
01127	JFX	AL	WALKER	WALKER COUNTY-BEVILL FI	84	0.1
06021	WLW	CA	GLENN	WILLOWS-GLENN COUNTY	84	0.1
05031	JBR	AR	CRAIGHEAD	JONESBORO MUNI	84	0.1
16019	IDA	ID	BONNEVILLE	IDAHO FALLS RGNL	84	0.1

23017	IZG	ME	OXFORD	EASTERN SLOPES REGIONAL	84	0.1
34019	N40	NJ	HUNTERDON	SKY MANOR	84	0.1
21073	FFT	KY	FRANKLIN	CAPITAL CITY	83	0.1
56021	CYS	WY	LARAMIE	CHEYENNE	83	0.1
29027	JEF	MO	CALLAWAY	JEFFERSON CITY MEML	83	0.1
29189	1H0	MO	ST LOUIS	CREVE COEUR	83	0.1
32003	61B	NV	CLARK	BOULDER CITY MUNI	83	0.1
37161	FQD	NC	RUTHERFORD	RUTHERFORD CO - MARCHMA	83	0.1
23029	MVM	ME	WASHINGTON	MACHIAS VALLEY	83	0.1
06019	O32	CA	FRESNO	REEDLEY MUNI	83	0.1
05055	PGR	AR	GREENE	KIRK FIELD	83	0.1
42021	JST	PA	CAMBRIA	JOHN MURTHA JOHNSTOWN-C	83	0.1
16083	TWF	ID	TWIN FALLS	JOSLIN FIELD - MAGIC VA	83	0.1
05131	FSM	AR	SEBASTIAN	FORT SMITH REGIONAL	83	0.1
39119	ZZV	OH	MUSKINGUM	ZANESVILLE MUNI	83	0.1
56029	COD	WY	PARK	YELLOWSTONE REGIONAL	82	0.1
55073	CWA	WI	MARATHON	CENTRAL WISCONSIN	82	0.1
17195	SQI	IL	WHITESIDE	WHITESIDE CO ARPT-JOS H	82	0.1
22005	L38	LA	ASCENSION	LOUISIANA REGIONAL	82	0.1
22101	PTN	LA	ST MARY	HARRY P WILLIAMS MEMORI	82	0.1
17081	MVN	IL	JEFFERSON	MOUNT VERNON	82	0.1
46005	HON	SD	BEADLE	HURON REGIONAL	82	0.1
12023	LCQ	FL	COLUMBIA	LAKE CITY MUNI	82	0.1
39045	LHQ	OH	FAIRFIELD	FAIRFIELD COUNTY	81	0.1
12055	AVO	FL	HIGHLANDS	AVON PARK MUNI	81	0.1
01089	MDQ	AL	MADISON	MADISON COUNTY EXECUTIV	81	0.1
16017	SZT	ID	BONNER	SANDPOINT	81	0.1
26093	45G	MI	LIVINGSTON	BRIGHTON	81	0.1
16031	BYI	ID	CASSIA	BURLEY MUNI	81	0.1
05007	SLG	AR	BENTON	SMITH FIELD	81	0.1
49021	CDC	UT	IRON	CEDAR CITY REGIONAL	81	0.1
17157	SAR	IL	RANDOLPH	SPARTA COMMUNITY-HUNTER	81	0.1
48471	UTS	TX	WALKER	HUNTSVILLE MUNI	81	0.1
38101	MOT	ND	WARD	MINOT INTL	81	0.1
23017	81B	ME	OXFORD	OXFORD COUNTY REGIONAL	81	0.1
45041	FLO	SC	FLORENCE	FLORENCE REGIONAL	80	0.1
13255	6A2	GA	SPALDING	GRIFFIN-SPALDING COUNTY	80	0.1
39003	AOH	OH	ALLEN	LIMA ALLEN COUNTY	80	0.1
48309	CNW	TX	MC LENNAN	TSTC WACO	80	0.1
55071	MTW	WI	MANITOWOC	MANITOWOC COUNTY	80	0.1
05145	SRC	AR	WHITE	SEARCY MUNI	80	0.1
16011	U02	ID	BINGHAM	MCCARLEY FLD	80	0.1
41035	LMT	OR	KLAMATH	KLAMATH FALLS	80	0.1
19011	BJI	MN	BELTRAMI	BEMIDJI-BELTRAMI COUNTY	80	0.1
06043	MPI	CA	MARIPOSA	MARIPOSA-YOSEMITE	80	0.1
04015	IFP	AZ	MOHAVE	LAUGHLIN/BULLHEAD INTER	79	0.1
12007	42J	FL	CLAY	KEYSTONE AIRPARK	79	0.1
06049	AAT	CA	MODOC	ALTURAS MUNI	79	0.1

39061	ISZ	OH	HAMILTON	CINCINNATI-BLUE ASH	79	0.1
21173	IOB	KY	MONTGOMERY	MOUNT STERLING-MONTGOME	79	0.1
06097	O31	CA	SONOMA	HEALDSBURG MUNI	79	0.1
06071	L35	CA	SAN BERNARDINO	BIG BEAR CITY	79	0.1
47177	RNC	TN	WARREN	WARREN COUNTY MEMORIAL	79	0.1
01067	0J6	AL	HENRY	HEADLAND MUNI	78	0.1
06107	VIS	CA	TULARE	VISALIA MUNI	78	0.1
06079	PRB	CA	SAN LUIS OBISPO	PASO ROBLES MUNI	78	0.1
28059	PQL	MS	JACKSON	TRENT LOTT INTERNATIONA	78	0.1
05095	4M8	AR	MONROE	CLARENDON MUNI	78	0.1
50023	MPV	VT	WASHINGTON	EDWARD F KNAPP STATE	78	0.1
48503	ONY	TX	YOUNG	OLNEY MUNI	78	0.1
37097	SVH	NC	IREDELL	STATESVILLE MUNI	78	0.1
08037	EGE	CO	EAGLE	EAGLE COUNTY REGIONAL	78	0.1
55111	DLL	WI	SAUK	BARABOO WISCONSIN DELLS	78	0.1
05051	HOT	AR	GARLAND	MEMORIAL FIELD	78	0.1
16021	65S	ID	BOUNDARY	BOUNDARY COUNTY	78	0.1
05125	M99	AR	SALINE	SALINE COUNTY/WATTS FIE	78	0.1
45027	MNI	SC	CLARENDON	SANTEE COOPER REGIONAL	78	0.1
39093	LPR	OH	LORAIN	LORAIN COUNTY REGIONAL	78	0.1
53037	ELN	WA	KITTITAS	BOWERS FIELD	77	0.1
54025	LWB	WV	GREENBRIER	GREENBRIER VALLEY	77	0.1
45035	DYB	SC	DORCHESTER	SUMMERVILLE	77	0.1
40047	WDG	OK	GARFIELD	ENID WOODRING RGNL	77	0.1
20161	MHK	KS	RILEY	MANHATTAN RGNL	77	0.1
05143	FYV	AR	WASHINGTON	DRAKE FIELD	77	0.1
53063	DEW	WA	SPOKANE	DEER PARK	77	0.1
25003	GBR	MA	BERKSHIRE	GREAT BARRINGTON	77	0.1
31019	EAR	NE	BUFFALO	KEARNEY MUNI	77	0.1
39029	02G	OH	COLUMBIANA	COLUMBIANA COUNTY	77	0.1
47189	M54	TN	WILSON	LEBANON MUNI	77	0.1
29019	COU	MO	BOONE	COLUMBIA REGIONAL	77	0.1
09015	IJD	CT	WINDHAM	WINDHAM	76	0.1
41059	PDT	OR	UMATILLA	EASTERN OREGON REGIONAL	76	0.1
36103	MTP	NY	SUFFOLK	MONTAUK	76	0.1
01123	ALX	AL	TALLAPOOSA	THOMAS C RUSSELL FLD	76	0.1
37083	RZZ	NC	HALIFAX	HALIFAX COUNTY	76	0.1
56039	JAC	WY	TETON	JACKSON HOLE	76	0.1
13021	MCN	GA	BIBB	MIDDLE GEORGIA REGIONAL	76	0.1
53041	TDO	WA	LEWIS	TOLEDO-WINLOCK ED CARLS	76	0.1
48251	CPT	TX	JOHNSON	CLEBURNE MUNI	76	0.1
47031	THA	TN	COFFEE	TULLAHOMA REGIONAL ARPT	76	0.1
39123	PCW	OH	OTTAWA	CARL R KELLER FIELD	76	0.1
35035	ALM	NM	OTERO	ALAMOGORDO-WHITE SANDS	75	0.1
13057	47A	GA	CHEROKEE	CHEROKEE COUNTY	75	0.1
42007	PJC	PA	BEAVER	ZELIENOPLE MUNI	75	0.1
17097	C81	IL	LAKE	CAMPBELL	75	0.1
04003	DUG	AZ	COCHISE	BISBEE DOUGLAS INTL	75	0.1

06031	HJO	CA	KINGS	HANFORD MUNI	75	0.1
22077	HZR	LA	POINTE COUPEE	FALSE RIVER RGNL	75	0.1
05093	MXA	AR	MISSISSIPPI	MANILA MUNI	75	0.1
06113	O41	CA	YOLO	WATTS-WOODLAND	75	0.1
53001	S70	WA	ADAMS	OTHELLO MUNI	75	0.1
13257	TOC	GA	STEPHENS	TOCCOA RG LETOURNEAU FI	75	0.1
19155	CBF	IA	POTTAWATTAMIE	COUNCIL BLUFFS MUNI	75	0.1
39025	I69	OH	CLERMONT	CLERMONT COUNTY	75	0.1
47107	MMI	TN	MC MINN	MCMINN COUNTY	75	0.1
12071	RSW	FL	LEE	SOUTHWEST FLORIDA INTL	75	0.1
13151	4A7	GA	HENRY	CLAYTON COUNTY - TARA F	75	0.1
34021	N87	NJ	MERCER	TRENTON-ROBBINSVILLE	75	0.1
28035	HBG	MS	FORREST	BOBBY L CHAIN MUNI	75	0.1
39061	I67	OH	HAMILTON	CINCINNATI WEST	75	0.1
34031	4N1	NJ	PASSAIC	GREENWOOD LAKE	74	0.1
42017	UKT	PA	BUCKS	QUAKERTOWN	74	0.1
02170	TKA	AK	MATA-SUS BOROUGH	TALKEETNA	74	0.1
18095	AID	IN	MADISON	ANDERSON MUNICIPAL-DARL	74	0.1
31157	BFF	NE	SCOTTS BLUFF	WESTERN NEB. RGNL/WILLI	74	0.1
39011	AXV	OH	AUGLAIZE	NEIL ARMSTRONG	74	0.1
17197	JOT	IL	WILL	JOLIET REGIONAL	74	0.1
29201	CGI	MO	SCOTT	CAPE GIRARDEAU REGIONAL	73	0.1
39047	I23	OH	FAYETTE	FAYETTE COUNTY	73	0.1
21199	SME	KY	PULASKI	SOMERSET-PULASKI COUNTY	73	0.1
19041	SPW	IA	CLAY	SPENCER MUNI	73	0.1
06071	VCV	CA	SAN BERNARDINO	SOUTHERN CALIFORNIA LOG	73	0.1
02060	5NK	AK	BRISTOL BAY	NAKNEK	73	0.1
37157	SIF	NC	ROCKINGHAM	ROCKINGHAM COUNTY NC SH	73	0.1
15009	JHM	HI	MAUI	KAPALUA	73	0.1
37125	SOP	NC	MOORE	MOORE COUNTY	73	0.1
18081	HFY	IN	JOHNSON	GREENWOOD MUNI	72	0.1
56033	SHR	WY	SHERIDAN	SHERIDAN COUNTY	72	0.1
40087	1K4	OK	MC CLAIN	DAVID JAY PERRY	72	0.1
37085	HRJ	NC	HARNETT	HARNETT COUNTY	72	0.1
20051	HYS	KS	ELLIS	HAYS RGNL	72	0.1
05057	M18	AR	HEMPSTEAD	HOPE MUNI	72	0.1
01015	ANB	AL	CALHOUN	ANNISTON METROPOLITAN	72	0.1
72037	VQS	PR		ANTONIO RIVERA RODRIGUE	71	0.1
22019	LCH	LA	CALCASIEU	LAKE CHARLES REGIONAL	71	0.1
18067	OKK	IN	HOWARD	KOKOMO MUNI	71	0.1
05113	MEZ	AR	POLK	MENA INTERMOUNTAIN MUNI	71	0.1
36063	IAG	NY	NIAGARA	NIAGARA FALLS INTL	71	0.1
08051	GUC	CO	GUNNISON	GUNNISON COUNTY	71	0.1
46065	PIR	SD	HUGHES	PIERRE REGIONAL	71	0.1
02122	ENA	AK	KENAI-COOK INLET	KENAI MUNI	70	0.1
06011	O08	CA	COLUSA	COLUSA COUNTY	70	0.1
41039	77S	OR	LANE	HOBBY FIELD	70	0.1
17121	ENL	IL	MARION	CENTRALIA MUNI	70	0.1

42063	IDI	PA	INDIANA	INDIANA COUNTY/JIMMY ST	70	0.1
19193	SUX	IA	WOODBURY	SIOUX GATEWAY/COL. BUD	70	0.1
26111	3BS	MI	MIDLAND	JACK BARSTOW	70	0.1
35037	TCC	NM	QUAY	TUCUMCARI MUNI	70	0.1
33015	PSM	NH	ROCKINGHAM	PEASE INTERNATIONAL TRA	69	0.1
42109	SEG	PA	SNYDER	PENN VALLEY	69	0.1
53039	DLS	OR	KLICKITAT	COLUMBIA GORGE REGIONAL	69	0.1
13313	DNN	GA	WHITFIELD	DALTON MUNI	69	0.1
06023	FOT	CA	HUMBOLDT	ROHNERVILLE	69	0.1
45029	RBW	SC	COLLETON	LOWCOUNTRY RGNL	69	0.1
06067	RIU	CA	SACRAMENTO	RANCHO MURIETA	69	0.1
34019	N85	NJ	HUNTERDON	ALEXANDRIA	69	0.1
04023	OLS	AZ	SANTA CRUZ	NOGALES INTL	68	0.1
05007	XNA	AR	BENTON	NORTHWEST ARKANSAS RGNL	68	0.1
01005	EUF	AL	BARBOUR	WEEDON FIELD	68	0.1
37013	OCW	NC	BEAUFORT	WARREN FIELD	68	0.1
19163	DVN	IA	SCOTT	DAVENPORT MUNI	68	0.1
36115	B01	NY	WASHINGTON	GRANVILLE	68	0.1
13077	CCO	GA	COWETA	NEWNAN COWETA COUNTY	68	0.1
06025	CXL	CA	IMPERIAL	CALEXICO INTL	68	0.1
40017	F29	OK	CANADIAN	CLARENCE E PAGE MUNI	68	0.1
16059	SMN	ID	LEMHI	LEMHI COUNTY	67	0.1
23011	AUG	ME	KENNEBEC	AUGUSTA STATE	67	0.1
18011	TYQ	IN	BOONE	INDIANAPOLIS TERRY	67	0.1
39159	MRT	OH	UNION	UNION COUNTY	67	0.1
29219	MO6	MO	WARREN	WASHINGTON MEMORIAL	67	0.1
48463	UVA	TX	UVALDE	GARNER FIELD	67	0.1
28067	LUL	MS	JONES	HESLER-NOBLE FIELD	67	0.1
36117	SDC	NY	WAYNE	WILLIAMSON-SODUS	67	0.1
08003	ALS	CO	ALAMOSA	SAN LUIS VALLEY REGIONA	67	0.1
50003	DDH	VT	BENNINGTON	WILLIAM H. MORSE STATE	66	0.1
47035	CSV	TN	CUMBERLAND	CROSSVILLE MEMORIAL-WHI	66	0.1
31119	OFK	NE	MADISON	KARL STEFAN MEMORIAL	66	0.1
55125	ARV	WI	VILAS	LAKELAND/NOBLE F. LEE M	66	0.1
25001	CQX	MA	BARNSTABLE	CHATHAM MUNI	66	0.1
36105	MSV	NY	SULLIVAN	SULLIVAN COUNTY INTL	66	0.1
49007	PUC	UT	CARBON	CARBON COUNTY	66	0.1
06047	MCE	CA	MERCED	MERCED MUNICIPAL/MACREA	66	0.1
06083	IZA	CA	SANTA BARBARA	SANTA YNEZ	66	0.1
13081	CKF	GA	CRISP	CRISP COUNTY-CORDELE	65	0.1
06103	RBL	CA	TEHAMA	RED BLUFF MUNI	65	0.1
55141	MFI	WI	WOOD	MARSHFIELD MUNI	65	0.1
06047	O15	CA	MERCED	TURLOCK MUNI	65	0.1
27047	AEL	MN	FREEBORN	ALBERT LEA MUNI	65	0.1
48027	ILE	TX	BELL	KILLEEN MUNI	65	0.1
02185	5CD	AK	UPPER YUKON	CHANDALAR SHELF	65	0.1
48257	TRL	TX	KAUFMAN	TERRELL MUNI	64	0.1
36009	OLE	NY	CATTARAUGUS	CATTARAUGUS COUNTY-OLEA	64	0.1

55027	WI07	WI	DODGE	WAUPUN	64	0.1
32013	WMC	NV	HUMBOLDT	WINNEMUCCA MUNI	64	0.1
06013	C83	CA	CONTRA COSTA	BYRON	64	0.1
24019	CGE	MD	DORCHESTER	CAMBRIDGE-DORCHESTER	64	0.1
18071	SER	IN	JACKSON	FREEMAN MUNI	64	0.1
24017	2W5	MD	CHARLES	MARYLAND	64	0.1
01095	8A0	AL	MARSHALL	THE ALBERTVILLE MUNI-TH	64	0.1
13175	DBN	GA	LAURENS	W H 'BUD' BARRON	64	0.1
39153	AKR	OH	SUMMIT	AKRON FULTON INTL	64	0.1
48485	CWC	TX	WICHITA	KICKAPOO DOWNTOWN AIRPA	64	0.1
34029	N12	NJ	OCEAN	LAKEWOOD	64	0.1
27099	AUM	MN	MOWER	AUSTIN MUNI	64	0.1
26125	Y47	MI	OAKLAND	OAKLAND SOUTHWEST	63	0.1
55025	87Y	WI	DANE	BLACKHAWK AIRFIELD	63	0.1
48469	VCT	TX	VICTORIA	VICTORIA REGIONAL	63	0.1
34009	WWD	NJ	CAPE MAY	CAPE MAY COUNTY	63	0.1
05035	AWM	AR	CRITTENDEN	WEST MEMPHIS MUNI	63	0.1
30105	GGW	MT	VALLEY	WOKAL FIELD/GLASGOW INT	63	0.1
18133	4I7	IN	PUTNAM	PUTNAM COUNTY	63	0.1
42081	IPT	PA	LYCOMING	WILLIAMSPORT RGNL	63	0.1
31111	LBF	NE	LINCOLN	NORTH PLATTE RGNL AIRPO	63	0.1
22127	0R5	LA	WINN	DAVID G JOYCE	63	0.1
05041	7M1	AR	DESHA	MC GEHEE MUNI	63	0.1
06009	CPU	CA	CALAVERAS	CALAVERAS CO-MAURY RASM	63	0.1
37109	IPJ	NC	LINCOLN	LINCOLNTON-LINCOLN COUN	63	0.1
46105	LEM	SD	PERKINS	LEMMON MUNI	63	0.1
26155	RNP	MI	SHIAWASSEE	OWOSSO COMMUNITY	63	0.1
39165	I68	OH	WARREN	LEBANON-WARREN COUNTY	63	0.1
35029	DMN	NM	LUNA	DEMING MUNI	63	0.1
17049	1H2	IL	EFFINGHAM	EFFINGHAM COUNTY MEMORI	63	0.1
45019	LRO	SC	CHARLESTON	MT PLEASANT RGNL-FAISON FIELD	63	0.1
06005	O70	CA	AMADOR	WESTOVER FIELD AMADOR C	63	0.1
12093	OBE	FL	OKEECHOBEE	OKEECHOBEE COUNTY	63	0.1
34001	N81	NJ	ATLANTIC	HAMMONTON MUNI	62	0.1
02020	Z41	AK	ANCHORAGE	LAKE HOOD STRIP	62	0.1
47113	MKL	TN	MADISON	MC KELLAR-SIPES REGIONA	62	0.1
04007	PAN	AZ	GILA	PAYSON	62	0.1
01003	5R4	AL	BALDWIN	FOLEY MUNI	62	0.1
45057	LKR	SC	LANCASTER	LANCASTER COUNTY-MC WHI	62	0.1
32019	O43	NV	LYON	YERINGTON MUNI	62	0.1
48061	BRO	TX	CAMERON	BROWNSVILLE/SOUTH PADRE	62	0.1
39027	I66	OH	CLINTON	CLINTON FIELD	62	0.1
06065	BLH	CA	RIVERSIDE	BLYTHE	62	0.1
28049	M16	MS	HINDS	JOHN BELL WILLIAMS	62	0.1
50021	RUT	VT	RUTLAND	RUTLAND STATE	61	0.1
31043	7K8	NE	DAKOTA	MARTIN FIELD	61	0.1
47167	M04	TN	TIPTON	COVINGTON MUNI	61	0.1
26067	Y70	MI	IONIA	IONIA COUNTY	61	0.1

39173	1G0	OH	WOOD	WOOD COUNTY	61	0.1
47119	MRC	TN	MAURY	MAURY COUNTY	61	0.1
16053	JER	ID	JEROME	JEROME COUNTY	61	0.1
39033	17G	OH	CRAWFORD	PORT BUCYRUS-CRAWFORD C	61	0.1
34023	3N6	NJ	MIDDLESEX	OLD BRIDGE	61	0.1
26047	MGN	MI	EMMET	HARBOR SPRINGS	61	0.1
32007	EKO	NV	ELKO	ELKO REGIONAL	61	0.1
12037	AAF	FL	FRANKLIN	APALACHICOLA MUNI	61	0.1
42079	HZL	PA	LUZERNE	HAZLETON MUNI	61	0.1
36003	ELZ	NY	ALLEGANY	WELLSVILLE MUNI ARPT,TA	61	0.1
51143	DAN	VA	PITTSYLVANIA	DANVILLE REGIONAL	60	0.1
13273	16J	GA	TERRELL	DAWSON MUNI	60	0.1
53077	1S5	WA	YAKIMA	SUNNYSIDE MUNI	60	0.1
05077	6M7	AR	LEE	LEE COUNTY-MARIANNA	60	0.1
48187	BAZ	TX	GUADALUPE	NEW BRAUNFELS MUNI	60	0.1
22117	BXA	LA	WASHINGTON	GEORGE R CARR MEMORIAL	60	0.1
17005	GRE	IL	BOND	GREENVILLE	60	0.1
13189	HQU	GA	MC DUFFIE	THOMSON-MCDUFFIE COUNTY	60	0.1
37101	JNX	NC	JOHNSTON	JOHNSTON COUNTY	60	0.1
37167	VUJ	NC	STANLY	STANLY COUNTY	60	0.1
48167	SPX	TX	GALVESTON	HOUSTON GULF	60	0.1
37107	ISO	NC	LENOIR	KINSTON RGNL JETPORT AT	60	0.1
05139	ELD	AR	UNION	SOUTH ARKANSAS REGIONAL	60	0.1
01021	02A	AL	CHILTON	GRAGG-WADE FIELD	60	0.1
41033	3S8	OR	JOSEPHINE	GRANTS PASS	60	0.1
21145	PAH	KY	MC CRACKEN	BARKLEY REGIONAL	60	0.1
48485	SPS	TX	WICHITA	SHEPPARD AFB/WICHITA FA	60	0.1
28133	IDL	MS	SUNFLOWER	INDIANOLA MUNI	60	0.1
06107	TLR	CA	TULARE	MEFFORD FIELD	60	0.1
05111	6M8	AR	POINSETT	MARKED TREE MUNI	60	0.1
47131	UCY	TN	OBION	EVERETT-STEWART	60	0.1
28027	CKM	MS	COAHOMA	FLETCHER FIELD	59	0.1
28087	GTR	MS	LOWNDES	GOLDEN TRIANGLE REGIONA	59	0.1
48053	BMQ	TX	BURNET	BURNET MUNI KATE CRADDO	59	0.1
05015	4M1	AR	CARROLL	CARROLL COUNTY	59	0.1
48453	RYW	TX	TRAVIS	LAGO VISTA TX - RUSTY A	59	0.1
42107	ZER	PA	SCHUYLKILL	SCHUYLKILL COUNTY /JOE	59	0.1
46011	BKX	SD	BROOKINGS	BROOKINGS MUNI	59	0.1
01055	GAD	AL	ETOWAH	GADSDEN MUNI	59	0.1
48465	DRT	TX	VAL VERDE	DEL RIO INTL	59	0.1
02060	WSN	AK	BRISTOL BAY	SOUTH NAKNEK NR 2	59	0.1
51047	CJR	VA	CULPEPER	CULPEPER REGIONAL	59	0.1
19169	AMW	IA	STORY	AMES MUNI	58	0.1
34041	1N7	NJ	WARREN	BLAIRSTOWN	58	0.1
34007	19N	NJ	CAMDEN	CAMDEN COUNTY	58	0.1
26109	MNM	MI	MENOMINEE	MENOMINEE-MARINETTE TWI	58	0.1
39021	I74	OH	CHAMPAIGN	GRIMES FIELD	58	0.1
40111	OKM	OK	OKMULGEE	OKMULGEE RGNL	58	0.1

02050	BET	AK	BETHEL	BETHEL	58	0.1
06027	BIH	CA	INYO	BISHOP	58	0.1
04021	E60	AZ	PINAL	ELOY MUNI	58	0.1
37155	LBT	NC	ROBESON	LUMBERTON MUNI	58	0.1
42127	N30	PA	WAYNE	CHERRY RIDGE	58	0.1
51053	PTB	VA	DINWIDDIE	DINWIDDIE COUNTY	58	0.1
37019	SUT	NC	BRUNSWICK	BRUNSWICK COUNTY	58	0.1
55027	UNU	WI	DODGE	DODGE COUNTY	58	0.1
06037	AVX	CA	LOS ANGELES	CATALINA	58	0.1
10001	33N	DE	KENT	DELAWARE AIRPARK	58	0.1
46093	49B	SD	MEADE	STURGIS MUNI	58	0.1
46081	SPF	SD	LAWRENCE	BLACK HILLS-CLYDE ICE F	57	0.1
13293	OPN	GA	UPSON	THOMASTON-UPSON COUNTY	57	0.1
41019	RBG	OR	DOUGLAS	ROSEBURG REGIONAL	57	0.1
46035	MHE	SD	DAVISON	MITCHELL MUNI	57	0.1
21209	27K	KY	SCOTT	GEORGETOWN SCOTT COUNTY	57	0.1
04017	INW	AZ	NAVAJO	WINSLOW-LINDBERGH REGIO	57	0.1
51089	MTV	VA	HENRY	BLUE RIDGE	57	0.1
36071	06N	NY	ORANGE	RANDALL	57	0.1
50023	0B7	VT	WASHINGTON	WARREN-SUGARBUSH	57	0.1
21101	EHR	KY	HENDERSON	HENDERSON CITY-COUNTY	57	0.1
48347	OCH	TX	NACOGDOCHES	A L MANGHAM JR. REGIONA	57	0.1
27097	LXL	MN	MORRISON	LITTLE FALLS/MORRISON C	56	0.1
23011	WVL	ME	KENNEBEC	WATERVILLE ROBERT LAFLE	56	0.1
53005	RLD	WA	BENTON	RICHLAND	56	0.1
45075	OGB	SC	ORANGEBURG	ORANGEBURG MUNI	56	0.1
42025	22N	PA	CARBON	JAKE ARNER MEMORIAL	56	0.1
26017	3CM	MI	BAY	JAMES CLEMENTS MUNI	56	0.1
40139	GUY	OK	TEXAS	GUYMON MUNI	56	0.1
41043	S12	OR	LINN	ALBANY MUNI	56	0.1
27171	CFE	MN	WRIGHT	BUFFALO MUNI	56	0.1
12091	VPS	FL	OKALOOSA	EGLIN AFB	56	0.1
36065	1B4	NY	ONEIDA	KAMP	56	0.1
48231	GVT	TX	HUNT	MAJORS	55	0.1
54055	BLF	VA	BLAND	MERCER COUNTY	55	0.1
17197	LL40	IL	WILL	FRANKFORT	55	0.1
13091	EZM	GA	DODGE	HEART OF GEORGIA RGNL	55	0.1
23003	FVE	ME	AROOSTOOK	NORTHERN AROOSTOOK REGI	55	0.1
06017	E36	CA	EL DORADO	GEORGETOWN	55	0.1
13115	RMG	GA	FLOYD	RICHARD B RUSSELL	55	0.1
26025	RMY	MI	CALHOUN	BROOKS FIELD	55	0.1
37159	RUQ	NC	ROWAN	ROWAN COUNTY	55	0.1
37193	UKF	NC	WILKES	WILKES COUNTY	55	0.1
12051	X14	FL	HENDRY	LA BELLE MUNI	55	0.1
48367	MWL	TX	PARKER	MINERAL WELLS	55	0.1
27061	GPZ	MN	ITASCA	GRAND RAPIDS/ITASCA CO-	55	0.1
45043	GGE	SC	GEORGETOWN	GEORGETOWN COUNTY	55	0.1
01093	HAB	AL	MARION	MARION COUNTY-RANKIN FI	55	0.1

26073	MOP	MI	ISABELLA	MOUNT PLEASANT MUNI	55	0.1
55069	RRL	WI	LINCOLN	MERRILL MUNI	55	0.1
30083	SDY	MT	RICHLAND	SIDNEY-RICHLAND MUNI	55	0.1
51177	EZF	VA	SPOTSYLVANIA	SHANNON	54	0.1
42091	N47	PA	MONTGOMERY	POTTSTOWN MUNI	54	0.1
53045	SHN	WA	MASON	SANDERSON FIELD	54	0.1
36069	D38	NY	ONTARIO	CANANDAIGUA	54	0.1
42097	N79	PA	NORTHUMBERLAND	NORTHUMBERLAND COUNTY	54	0.1
08107	SBS	CO	ROUTT	STEAMBOAT SPRINGS/BOB A	54	0.1
19113	C17	IA	LINN	MARION	54	0.1
36061	JRB	NY	NEW YORK	PORT AUTH-DWNTN-MANHATT	54	0.1
48365	4F2	TX	PANOLA	PANOLA COUNTY-SHARPE FI	54	0.1
40051	CHK	OK	GRADY	CHICKASHA MUNI	54	0.1
36077	N66	NY	OTSEGO	ONEONTA MUNI	54	0.1
08085	MTJ	CO	MONTROSE	MONTROSE REGIONAL	54	0.1
26005	35D	MI	ALLEGAN	PADGHAM FIELD	53	0.1
27041	AXN	MN	DOUGLAS	CHANDLER FIELD	53	0.1
39049	LCK	OH	FRANKLIN	RICKENBACKER INTERNATIO	53	0.1
36123	PEO	NY	YATES	PENN YAN	53	0.1
51015	SHD	VA	AUGUSTA	SHENANDOAH VALLEY REGIO	53	0.1
40017	RQO	OK	CANADIAN	EL RENO MUNI AIR PARK	53	0.1
28075	MEI	MS	LAUDERDALE	KEY FIELD	53	0.1
22067	BQP	LA	MOREHOUSE	MOREHOUSE MEMORIAL	53	0.1
42121	6G1	PA	CRAWFORD	TITUSVILLE	53	0.1
26097	MCD	MI	MACKINAC	MACKINAC ISLAND	53	0.1
42121	FKL	PA	VENANGO	VENANGO REGIONAL	53	0.1
02290	MCG	AK	KUSKOKWIM	MC GRATH	53	0.1
42085	4G1	PA	MERCER	GREENVILLE MUNI	53	0.1
28115	22M	MS	PONTOTOC	PONTOTOC COUNTY	52	0.1
46055	PHP	SD	HAAKON	PHILIP	52	0.1
17099	VYS	IL	LA SALLE	ILLINOIS VALLEY RGNL-WA	52	0.1
18085	ASW	IN	KOSCIUSKO	WARSAW MUNI	52	0.1
09007	SNC	CT	MIDDLESEX	CHESTER	52	0.1
13127	BQK	GA	GLYNN	BRUNSWICK GOLDEN ISLES	52	0.1
48061	HRL	TX	CAMERON	VALLEY INTL	52	0.1
20055	GCK	KS	FINNEY	GARDEN CITY REGIONAL	52	0.1
01117	EET	AL	SHELBY	SHELBY COUNTY	52	0.1
04003	FHU	AZ	COCHISE	SIERRA VISTA MUNI-LIBBY	52	0.1
22053	3R7	LA	JEFFERSON DAVIS	JENNINGS	52	0.1
55125	EGV	WI	VILAS	EAGLE RIVER UNION	52	0.1
17143	3MY	IL	PEORIA	MOUNT HAWLEY AUXILIARY	52	0.1
18053	MZZ	IN	GRANT	MARION MUNI	52	0.1
02050	Z13	AK	BETHEL	AKIACHAK	52	0.1
41029	S03	OR	JACKSON	ASHLAND MUNI-SUMNER PAR	52	0.1
39161	VNW	OH	VAN WERT	VAN WERT COUNTY	52	0.1
45025	CQW	SC	CHESTERFIELD	CHERAW MUNI/LYNCH BELLI	51	0.1
37037	5W8	NC	CHATHAM	SILER CITY MUNICIPAL	51	0.1
39043	89D	OH	ERIE	KELLEYS ISLAND LAND FLD	51	0.1

09015	5B3	CT	WINDHAM	DANIELSON	51	0.1
18145	GEZ	IN	SHELBY	SHELBYVILLE MUNI	51	0.1
01097	2R5	AL	MOBILE	ST ELMO	51	0.1
30081	6S5	MT	RAVALLI	RAVALLI COUNTY	51	0.1
24003	W18	MD	ANNE ARUNDEL	SUBURBAN	51	0.1
27083	MML	MN	LYON	MARSHALL MUNI-RYAN FIEL	51	0.1
28003	CRX	MS	ALCORN	ROSCOE TURNER	51	0.1
28149	VKS	MS	WARREN	VICKSBURG MUNI	51	0.1
49045	TVY	UT	TOOELE	BOLINDER FIELD-TOOELE V	51	0.1
23015	IWI	ME	LINCOLN	WISCASSET	51	0.1
08121	AKO	CO	WASHINGTON	COLORADO PLAINS REGIONA	51	0.1
39075	10G	OH	HOLMES	HOLMES COUNTY	51	0.1
53025	EPH	WA	GRANT	EPHRATA MUNI	51	0.1
36075	FZY	NY	OSWEGO	OSWEGO COUNTY	51	0.1
01059	M22	AL	FRANKLIN	RUSSELLVILLE MUNI	51	0.1
37133	OAJ	NC	ONSLOW	ALBERT J ELLIS	50	0.1
39083	4I3	OH	KNOX	KNOX COUNTY	50	0.1
27119	CKN	MN	POLK	CROOKSTON MUNI KIRKWOOD	50	0.1
40121	MLC	OK	PITTSBURG	MC ALESTER REGIONAL	50	0.1
55135	PCZ	WI	WAUPACA	WAUPACA MUNI	50	0.1
39149	I12	OH	SHELBY	SIDNEY MUNI	50	0.1
38071	DVL	ND	RAMSEY	DEVILS LAKE MUNI	50	0.1
17111	0C0	IL	MC HENRY	DACY	50	0.1
23025	2B7	ME	SOMERSET	PITTSFIELD MUNI	50	0.1
20053	9K7	KS	ELLSWORTH	ELLSWORTH MUNI	50	0.1
02170	BGQ	AK	UNORGANIZED	BIG LAKE	50	0.1
48205	DHT	TX	HARTLEY	DALHART MUNI	50	0.1
13069	DQH	GA	COFFEE	DOUGLAS MUNI	50	0.1
17177	FEP	IL	STEPHENSON	ALBERTUS	50	0.1
35028	LAM	NM	LOS ALAMOS	LOS ALAMOS	50	0.1
12021	MKY	FL	COLLIER	MARCO ISLAND	50	0.1
06021	O37	CA	GLENN	HAIGH FIELD	50	0.1
23025	OWK	ME	SOMERSET	CENTRAL MAINE ARPT OF N	50	0.1
18091	PPO	IN	LA PORTE	LA PORTE MUNI	50	0.1
27135	ROX	MN	ROSEAU	ROSEAU MUNI/RUDY BILLBE	50	0.1
28105	STF	MS	OKTIBBEHA	GEORGE M BRYAN	50	0.1
48061	T31	TX	COLLIN	AERO COUNTRY	50	0.1
17019	TIP	IL	CHAMPAIGN	RANTOUL NATL AVN CNTR-F	50	0.1
54051	MPG	WV	MARSHALL	MARSHALL COUNTY	50	0.1
36101	4G6	NY	STEUBEN	HORNELL MUNI	50	0.1
50011	FSO	VT	FRANKLIN	FRANKLIN COUNTY STATE	50	0.1
36031	LKP	NY	ESSEX	LAKE PLACID	50	0.1
27147	OWA	MN	STEELE	OWATONNA DEGNER RGNL	50	0.1
12105	X07	FL	POLK	LAKE WALES MUNI	50	0.1
20091	K34	KS	JOHNSON	GARDNER MUNI	50	0.1
23003	HUL	ME	AROOSTOOK	HOULTON INTL	50	0.1
26115	TTF	MI	MONROE	CUSTER	50	0.1
51137	OMH	VA	ORANGE	ORANGE COUNTY	50	0.1

06029	MHV	CA	KERN	MOJAVE	49	0.1
55005	RPD	WI	BARRON	RICE LAKE REGIONAL - CA	49	0.1
39053	GAS	OH	GALLIA	GALLIA-MEIGS REGIONAL	49	0.1
53027	HQM	WA	GRAYS HARBOR	BOWERMAN	49	0.1
34005	N73	NJ	BURLINGTON	RED LION	49	0.1
01087	06A	AL	MACON	MOTON FIELD MUNI	49	0.1
22095	1L0	LA	ST JOHN THE BAPTIST	ST JOHN THE BAPTIST PAR	49	0.1
39063	FDY	OH	HANCOCK	FINDLAY	49	0.1
39031	I40	OH	COSHOCTON	RICHARD DOWNING	49	0.1
13021	MAC	GA	BIBB	HERBERT SMART DOWNTOWN	49	0.1
13031	TBR	GA	BULLOCH	STATESBORO-BULLOCH COUN	49	0.1
26139	3GM	MI	OTTAWA	GRAND HAVEN MEML AIRPAR	49	0.1
04025	P52	AZ	YAVAPAI	COTTONWOOD	49	0.1
42087	RVL	PA	MIFFLIN	MIFFLIN COUNTY	49	0.1
29021	STJ	MO	BUCHANAN	ROSECRANS MEMORIAL	49	0.1
12027	X06	FL	DE SOTO	ARCADIA MUNI	49	0.1
31079	GRI	NE	HALL	CENTRAL NEBRASKA REGION	48	0.1
21047	HVC	KY	CHRISTIAN	HOPKINSVILLE-CHRISTIAN	48	0.1
26147	76G	MI	ST CLAIR	MARINE CITY	48	0.1
55031	SUW	WI	DOUGLAS	RICHARD I BONG	48	0.1
54067	SXL	WV	NICHOLAS	SUMMERSVILLE	48	0.1
53065	63S	WA	STEVENS	COLVILLE MUNI	48	0.1
38105	ISN	ND	WILLIAMS	SLOULIN FLD INTL	48	0.1
35027	SRR	NM	LINCOLN	SIERRA BLANCA REGIONAL	48	0.1
18063	3SY	IN	HENDRICKS	SPEEDWAY AIRPORT	48	0.1
47103	FYM	TN	LINCOLN	FAYETTEVILLE MUNI	48	0.1
20103	FLV	KS	LEAVENWORTH	SHERMAN AAF	48	0.1
01099	MVC	AL	MONROE	MONROE COUNTY	48	0.1
36021	1B1	NY	COLUMBIA	COLUMBIA COUNTY	48	0.1
17057	CTK	IL	FULTON	INGERSOLL	48	0.1
06029	DLO	CA	KERN	DELANO MUNI	48	0.1
37045	EHO	NC	CLEVELAND	SHELBY MUNI	48	0.1
05023	HBZ	AR	CLEBURNE	HEBER SPRINGS MUNI	48	0.1
17121	SLO	IL	MARION	SALEM-LECKRONE	48	0.1
17051	VLA	IL	FAYETTE	VANDALIA MUNI	48	0.1
53047	OMK	WA	OKANOGAN	OMAK	48	0.1
02220	SIT	AK	SITKA	SITKA ROCKY GUTIERREZ	48	0.1
16081	DIJ	ID	TETON	DRIGGS-REED MEML	47	0.1
47045	DYR	TN	DYER	DYERSBURG MUNI	47	0.1
46079	MDS	SD	LAKE	MADISON MUNI	47	0.1
53047	S97	WA	OKANOGAN	ANDERSON FIELD	47	0.1
02122	HOM	AK	KENAI-COOK INLET	HOMER	47	0.1
55113	HYR	WI	SAWYER	SAWYER COUNTY	47	0.1
12063	MAI	FL	JACKSON	MARIANNA MUNI	47	0.1
20057	DDC	KS	FORD	DODGE CITY REGIONAL	47	0.1
05065	6M2	AR	IZARD	HORSESHOE BEND	46	0.1
06071	DAG	CA	SAN BERNARDINO	BARSTOW-DAGGETT	46	0.1
48437	I06	TX	SWISHER	CITY OF TULIA/SWISHER C	46	0.1

27131	FBL	MN	RICE	FARIBAULT MUNI	46	0.1
49047	VEL	UT	UINTAH	VERNAL	46	0.1
17123	C75	IL	MARSHALL	MARSHALL COUNTY	46	0.1
18031	I34	IN	DECATUR	GREENSBURG-DECATUR COUN	46	0.1
01031	EDN	AL	COFFEE	ENTERPRISE MUNI	46	0.1
40065	AXS	OK	JACKSON	ALTUS/QUARTZ MOUNTAIN R	46	0.1
47123	MNV	TN	MONROE	MONROE COUNTY	46	0.1
18093	BFR	IN	LAWRENCE	VIRGIL I GRISSOM MUNI	46	0.1
51127	W96	VA	NEW KENT	NEW KENT COUNTY	46	0.1
48245	BMT	TX	JEFFERSON	BEAUMONT MUNI	46	0.1
26065	TEW	MI	INGHAM	MASON JEWETT FIELD	46	0.1
26047	PLN	MI	EMMET	PELLSTON REGIONAL AIRPO	46	0.1
12123	40J	FL	TAYLOR	PERRY-FOLEY	46	0.1
42015	N27	PA	BRADFORD	BRADFORD COUNTY	46	0.1
17001	UIN	IL	ADAMS	QUINCY REGIONAL-BALDWIN	46	0.1
39071	HOC	OH	HIGHLAND	HIGHLAND COUNTY	45	0.1
48183	07F	TX	GREGG	GLADEWATER MUNI	45	0.1
25027	GDM	MA	WORCESTER	GARDNER MUNI	45	0.050
09009	MMK	CT	NEW HAVEN	MERIDEN MARKHAM MUNI	45	0.050
25011	0B5	MA	FRANKLIN	TURNERS FALLS	45	0.050
12029	CTY	FL	DIXIE	CROSS CITY	45	0.050
40041	GMJ	OK	DELAWARE	GROVE MUNI	45	0.050
22083	M79	LA	RICHLAND	JOHN H HOOKS JR MEMORIA	45	0.050
22097	OPL	LA	ST LANDRY	ST LANDRY PARISH-AHART	45	0.050
13225	PXE	GA	HOUSTON	PERRY-HOUSTON COUNTY	45	0.050
05007	VBT	AR	BENTON	BENTONVILLE MUNI/LOUISE	45	0.050
36029	D22	NY	ERIE	Angola Airways	45	0.050
19187	FOD	IA	WEBSTER	FORT DODGE REGIONAL	45	0.050
20177	FOE	KS	SHAWNEE	FORBES FIELD	45	0.050
42111	2G9	PA	SOMERSET	SOMERSET COUNTY	45	0.050
49003	BMC	UT	BOX ELDER	BRIGHAM CITY	45	0.050
06099	O27	CA	STANISLAUS	OAKDALE	45	0.050
72097	MAZ	PR		EUGENIO MARIA DE HOSTOS	45	0.049
51095	JGG	VA	JAMES CITY	WILLIAMSBURG-JAMESTOWN	45	0.049
34009	26N	NJ	CAPE MAY	OCEAN CITY MUNI	45	0.049
27137	ELO	MN	ST LOUIS	ELY MUNI	45	0.049
27069	HCO	MN	KITTSON	HALLOCK MUNI	45	0.049
27067	BDH	MN	KANDIYOHI	WILLMAR MUNI-JOHN L RIC	45	0.049
22041	F89	LA	FRANKLIN	WINNSBORO MUNICIPAL	45	0.049
16047	GNG	ID	GOODING	GOODING MUNI	44	0.049
21013	1A6	KY	BELL	MIDDLESBORO-BELL COUNTY	44	0.049
26015	9D9	MI	BARRY	HASTINGS	44	0.049
27137	EVM	MN	ST LOUIS	EVELETH-VIRGINIA MUNI	44	0.049
47073	RVN	TN	HAWKINS	HAWKINS COUNTY	44	0.049
16039	U76	ID	ELMORE	MOUNTAIN HOME MUNI	44	0.049
27137	HIB	MN	ST LOUIS	CHISHOLM-HIBBING	44	0.049
13137	AJR	GA	HABERSHAM	HABERSHAM COUNTY	44	0.049
21137	DVK	KY	LINCOLN	STUART POWELL FIELD	44	0.049

42021	9G8	PA	CAMBRIA	EBENSBURG	44	0.049
50015	MVL	VT	LAMOILLE	MORRISVILLE-STOWE STATE	44	0.049
28059	5R2	MS	JACKSON	OCEAN SPRINGS	44	0.048
35015	CNM	NM	EDDY	CAVERN CITY AIR TRML	44	0.048
04013	E25	AZ	MARICOPA	WICKENBURG MUNI	44	0.048
06071	TNP	CA	SAN BERNARDINO	TWENTYNINE PALMS	44	0.048
28151	GLH	MS	WASHINGTON	MID DELTA RGNL	44	0.048
02231	YAK	AK	SKAGWAY-YAKUTAT	YAKUTAT	44	0.048
48055	50R	TX	CALDWELL	LOCKHART MUNI	44	0.048
41061	LGD	OR	UNION	LA GRANDE/UNION COUNTY	44	0.048
48049	BWD	TX	BROWN	BROWNWOOD RGNL	44	0.048
55095	OEO	WI	POLK	L O SIMENSTAD MUNI	44	0.048
18151	ANQ	IN	STEUBEN	TRI-STATE STEUBEN COUNT	44	0.048
41017	S21	OR	DESCHUTES	SUNRIVER	43	0.048
24023	2G4	MD	GARRETT	GARRETT COUNTY	43	0.048
36027	N69	NY	DUTCHESS	STORMVILLE	43	0.048
55099	PBH	WI	PRICE	PRICE COUNTY	43	0.048
55115	3WO	WI	SHAWANO	SHAWANO MUNI	43	0.048
42083	BFD	PA	MC KEAN	BRADFORD REGIONAL	43	0.048
48249	ALI	TX	JIM WELLS	ALICE INTL	43	0.048
42089	N53	PA	MONROE	STROUDSBURG-POCONO	43	0.048
36017	OIC	NY	CHENANGO	LT WARREN EATON	43	0.048
55045	EFT	WI	GREEN	MONROE MUNI	43	0.048
39117	4I9	OH	MORROW	MORROW COUNTY	43	0.048
26123	FFX	MI	NEWAYGO	FREMONT MUNI	43	0.047
48097	GLE	TX	COOKE	GAINESVILLE MUNI	43	0.047
42009	HMZ	PA	BEDFORD	BEDFORD COUNTY	43	0.047
17029	MTO	IL	COLES	COLES COUNTY MEMORIAL	43	0.047
02122	SOV	AK	KENAI-COOK INLET	SELDOVIA	43	0.047
28141	15M	MS	TISHOMINGO	IUKA	43	0.047
47117	LUG	TN	MARSHALL	ELLINGTON	43	0.047
37171	MWK	NC	SURRY	MOUNT AIRY/SURRY COUNTY	43	0.047
06105	O86	CA	TRINITY	TRINITY CENTER	43	0.047
06105	F62	CA	TRINITY	HAYFORK	43	0.047
72113	PSE	PR		MERCEDITA	43	0.047
36023	N03	NY	CORTLAND	CORTLAND COUNTY-CHASE F	43	0.047
48325	HDO	TX	MEDINA	HONDO MUNI	43	0.047
18069	HHG	IN	HUNTINGTON	HUNTINGTON MUNI	43	0.047
22019	UXL	LA	CALCASIEU	SOUTHLAND FIELD	42	0.047
51035	HLX	VA	CARROLL	TWIN COUNTY	42	0.047
36013	JHW	NY	CHAUTAUQUA	CHAUTAUQUA COUNTY/JAMES	42	0.047
28097	5A6	MS	MONTGOMERY	WINONA-MONTGOMERY COUNT	42	0.047
41043	S30	OR	LINN	LEBANON STATE	42	0.047
42051	VVS	PA	FAYETTE	CONNELLSVILLE	42	0.047
27059	CBG	MN	ISANTI	CAMBRIDGE MUNI	42	0.046
46129	MBG	SD	WALWORTH	MOBRIDGE MUNI	42	0.046
37127	RWI	NC	NASH	ROCKY MOUNT-WILSON RGNL	42	0.046
41039	61S	OR	LANE	COTTAGE GROVE STATE	42	0.046

05089	FLP	AR	MARION	MARION COUNTY REGIONAL	42	0.046
29167	M17	MO	POLK	BOLIVAR MUNICIPAL	42	0.046
49019	CNY	UT	GRAND	CANYONLANDS FIELD	42	0.046
06017	TVL	CA	EL DORADO	LAKE TAHOE	42	0.046
13299	AYS	GA	WARE	WAYCROSS-WARE COUNTY	41	0.046
13129	CZL	GA	GORDON	TOM B. DAVID FLD	41	0.046
37027	MRN	NC	CALDWELL	MORGANTON-LENOIR	41	0.046
48325	CVB	TX	MEDINA	CASTROVILLE MUNI	41	0.046
01049	4A9	AL	DE KALB	ISBELL FIELD	41	0.046
47079	PHT	TN	HENRY	HENRY COUNTY	41	0.046
39017	OXD	OH	BUTLER	MIAMI UNIVERSITY	41	0.045
12121	24J	FL	SUWANNEE	SUWANNEE COUNTY	41	0.045
37151	HBI	NC	RANDOLPH	ASHEBORO MUNI	41	0.045
26061	CMX	MI	HOUGHTON	HOUGHTON COUNTY MEMORIA	41	0.045
42089	MPO	PA	MONROE	POCONO MOUNTAINS MUNI	41	0.045
12075	X60	FL	LEVY	WILLISTON MUNI	41	0.045
39107	CQA	OH	MERCER	LAKEFIELD	41	0.045
16037	LLJ	ID	CUSTER	CHALLIS	41	0.045
42047	OYM	PA	ELK	ST MARYS MUNI	41	0.045
26087	D95	MI	LAPEER	DUPONT-LAPEER	41	0.045
34009	1N4	NJ	CAPE MAY	WOODBINE MUNI	41	0.045
35025	HOB	NM	LEA	LEA COUNTY RGNL	40	0.045
40101	MKO	OK	MUSKOGEE	DAVIS FIELD	40	0.045
55141	ISW	WI	WOOD	ALEXANDER FIELD SOUTH W	40	0.045
26137	GLR	MI	OTSEGO	OTSEGO COUNTY	40	0.045
08007	PSO	CO	ARCHULETA	STEVENS FIELD	40	0.045
06093	O46	CA	SISKIYOU	WEED	40	0.044
13285	LGC	GA	TROUP	LAGRANGE-CALLAWAY	40	0.044
06093	1O6	CA	SISKIYOU	DUNSMUIR MUNI-MOTT	40	0.044
27001	AIT	MN	AITKIN	AITKIN MUNI-STEVE KURTZ	40	0.044
37165	MEB	NC	SCOTLAND	LAURINBURG-MAXTON	40	0.044
06063	O02	CA	PLUMAS	NERVINO	40	0.044
04007	P13	AZ	GILA	SAN CARLOS APACHE	40	0.044
35041	PRZ	NM	ROOSEVELT	PORTALES MUNICIPAL	40	0.044
37039	RHP	NC	CHEROKEE	ANDREWS-MURPHY	40	0.044
53033	S60	WA	KING	KENMORE AIR HARBOR INC	40	0.044
55043	OVS	WI	GRANT	BOSCOBEL	40	0.044
29125	VIH	MO	MARIES	ROLLA NATIONAL	40	0.044
18037	HNB	IN	DUBOIS	HUNTINGBURG	40	0.044
51173	MKJ	VA	SMYTH	MOUNTAIN EMPIRE	40	0.044
01121	SCD	AL	TALLADEGA	MERKEL FIELD SYLACAUGA	40	0.044
28163	87I	MS	YAZOO	YAZOO COUNTY	40	0.044
46015	9V9	SD	BRULE	CHAMBERLAIN MUNI	40	0.044
48429	BKD	TX	STEPHENS	STEPHENS COUNTY	40	0.044
45011	BNL	SC	BARNWELL	BARNWELL COUNTY	40	0.044
02290	FYU	AK	UPPER YUKON	FORT YUKON	40	0.044
06063	O05	CA	PLUMAS	ROGERS FIELD	39	0.043
31025	PMV	NE	CASS	PLATTSMOUTH MUNI	39	0.043

08099	LAA	CO	PROWERS	LAMAR MUNI	39	0.043
27057	PKD	MN	HUBBARD	PARK RAPIDS MUNI-KONSHO	39	0.043
39069	7W5	OH	HENRY	HENRY COUNTY	39	0.043
26053	IWD	MI	GOGEBIC	GOGEBIC-IRON COUNTY	39	0.043
41045	ONO	OR	MALHEUR	ONTARIO MUNI	39	0.043
26165	CAD	MI	WEXFORD	WEXFORD COUNTY	39	0.043
48219	LLN	TX	HOCKLEY	LEVELLAND MUNI	39	0.043
05133	DEQ	AR	SEVIER	J LYNN HELMS SEVIER COU	39	0.043
01053	12J	AL	ESCAMBIA	BREWTON MUNI	39	0.043
45071	EOE	SC	NEWBERRY	NEWBERRY COUNTY	39	0.043
36055	7G0	NY	MONROE	LEDGEDALE AIRPARK	39	0.043
21161	FGX	KY	MASON	FLEMING-MASON	39	0.043
27015	ULM	MN	BROWN	NEW ULM MUNI	39	0.043
47077	M52	TN	HENDERSON	FRANKLIN WILKINS	39	0.043
02240	ORT	AK	FAIRBANKS	NORTHWAY	39	0.043
55055	88C	WI	JEFFERSON	PALMYRA MUNI	39	0.043
41011	S05	OR	COOS	BANDON STATE	39	0.043
38017	5N8	ND	CASS	CASSELTON REGIONAL	39	0.043
55131	HXF	WI	WASHINGTON	HARTFORD MUNI	39	0.043
28133	M37	MS	SUNFLOWER	RULEVILLE-DREW	39	0.043
27085	10D	MN	MC LEOD	WINSTED MUNI	39	0.042
16083	U03	ID	TWIN FALLS	BUHL MUNI	39	0.042
56005	GCC	WY	CAMPBELL	GILLETTE-CAMPBELL COUNT	38	0.042
40097	H71	OK	MAYES	MID-AMERICA INDUSTRIAL	38	0.042
01057	M95	AL	FAYETTE	RICHARD ARTHUR FIELD	38	0.042
01103	5M0	AL	MORGAN	ROUNTREE FIELD	38	0.042
18065	UWL	IN	HENRY	NEW CASTLE-HENRY CO. MU	38	0.042
39081	2G2	OH	JEFFERSON	JEFFERSON COUNTY AIRPAR	38	0.042
19057	BRL	IA	DES MOINES	SOUTHEAST IOWA REGIONAL	38	0.042
54049	4G7	WV	MARION	FAIRMONT MUNI-FRANKMAN	38	0.042
26159	LWA	MI	VAN BUREN	SOUTH HAVEN AREA REGION	38	0.042
12131	54J	FL	WALTON	DEFUNIAK SPRINGS	38	0.042
56041	EVW	WY	UINTA	EVANSTON-UINTA COUNTY B	38	0.042
39007	HZY	OH	ASHTABULA	ASHTABULA COUNTY	38	0.042
24031	W50	MD	MONTGOMERY	DAVIS	38	0.042
47053	TGC	TN	GIBSON	GIBSON COUNTY	38	0.042
51083	W78	VA	HALIFAX	WILLIAM M TUCK	38	0.042
05045	CWS	AR	FAULKNER	DENNIS F CANTRELL FIELD	38	0.042
28091	0R0	MS	MARION	COLUMBIA-MARION COUNTY	38	0.042
45053	3J1	SC	JASPER	RIDGELAND	38	0.042
37019	60J	NC	BRUNSWICK	OCEAN ISLE	38	0.042
48041	CFD	TX	BRAZOS	COULTER FIELD	38	0.042
37061	DPL	NC	DUPLIN	DUPLIN CO	38	0.042
05123	FCY	AR	ST FRANCIS	FORREST CITY MUNI	38	0.042
28001	HEZ	MS	ADAMS	HARDY-ANDERS FIELD NATC	38	0.042
27065	JMR	MN	KANABEC	MORA MUNI	38	0.042
36105	N37	NY	SULLIVAN	MONTICELLO	38	0.042
06023	O16	CA	HUMBOLDT	GARBERVILLE	38	0.042

13279	VDI	GA	TOOMBS	VIDALIA MUNI	38	0.042
12083	X35	FL	MARION	DUNNELLON/MARION CO & P	38	0.042
02122	SXQ	AK	KENAI-COOK INLET	SOLDOTNA	38	0.042
48321	BYY	TX	MATAGORDA	Bay City Municipal	38	0.041
08113	TEX	CO	SAN MIGUEL	TELLURIDE REGIONAL	37	0.041
21151	I39	KY	MADISON	MADISON	37	0.041
06007	CA92	CA	BUTTE	PARADISE SKYPARK	37	0.041
51191	VJI	VA	WASHINGTON	VIRGINIA HIGHLANDS	37	0.041
17173	2H0	IL	SHELBY	SHELBY COUNTY	37	0.041
46027	VMR	SD	CLAY	HAROLD DAVIDSON FIELD	37	0.041
21125	LOZ	KY	LAUREL	LONDON-CORBIN ARPT-MAGE	37	0.041
22069	IER	LA	NATCHITOCHES	NATCHITOCHES REGIONAL	37	0.041
47035	RKW	TN	CUMBERLAND	ROCKWOOD MUNI	37	0.041
32003	67L	NV	CLARK	MESQUITE	37	0.041
55013	RZN	WI	BURNETT	BURNETT COUNTY	37	0.041
18113	C62	IN	NOBLE	KENDALLVILLE MUNI	37	0.041
08125	2V5	CO	YUMA	WRAY MUNI	37	0.040
26117	13C	MI	MONTCALM	LAKEVIEW AIRPORT-GRIFFI	37	0.040
12021	TNT	FL	DADE	DADE-COLLIER TRAINING A	36	0.040
30027	LWT	MT	FERGUS	LEWISTOWN MUNI	36	0.040
39155	62D	OH	TRUMBULL	WARREN	36	0.040
16087	S87	ID	WASHINGTON	WEISER MUNI	36	0.040
53029	W10	WA	ISLAND	WHIDBEY AIR PARK	36	0.040
18149	OXI	IN	STARKE	STARKE COUNTY	36	0.040
28095	M40	MS	MONROE	MONROE COUNTY	36	0.040
12009	X59	FL	BREVARD	VALKARIA	36	0.040
12099	PHK	FL	PALM BEACH	PALM BEACH CO GLADES	36	0.040
27005	DTL	MN	BECKER	DETROIT LAKES-WETHING F	36	0.040
72053	X95	PR		DIEGO JIMENEZ TORRES	36	0.040
46123	ICR	SD	TRIPP	Winner Regional	36	0.040
41041	ONP	OR	LINCOLN	NEWPORT MUNI	36	0.040
27127	RWF	MN	REDWOOD	REDWOOD FALLS MUNI	36	0.040
26105	LDM	MI	MASON	MASON COUNTY	36	0.039
28143	M97	MS	TUNICA	TUNICA MUNICIPAL	36	0.039
41027	4S2	OR	HOOD RIVER	HOOD RIVER	36	0.039
55111	C35	WI	SAUK	REEDSBURG MUNI	36	0.039
39059	CDI	OH	GUERNSEY	CAMBRIDGE MUNI	35	0.039
39145	PMH	OH	SCIOTO	GREATER PORTSMOUTH REGI	35	0.039
31177	BTA	NE	WASHINGTON	BLAIR MUNI	35	0.039
42059	WAY	PA	GREENE	GREENE COUNTY	35	0.039
27095	PNM	MN	MILLE LACS	PRINCETON MUNI	35	0.039
18107	CFJ	IN	MONTGOMERY	CRAWFORDSVILLE MUNI	35	0.039
36121	01G	NY	WYOMING	PERRY-WARSAW	35	0.039
28141	01M	MS	TISHOMINGO	TISHOMINGO COUNTY	35	0.039
26081	24C	MI	KENT	LOWELL CITY	35	0.039
17119	3K6	IL	MADISON	ST LOUIS METRO-EAST/SHA	35	0.039
55111	91C	WI	SAUK	SAUK-PRAIRIE	35	0.039
05075	ARG	AR	LAWRENCE	WALNUT RIDGE REGIONAL	35	0.039

54057	CBE	MD	MINERAL	GREATER CUMBERLAND REGI	35	0.039
04025	E51	AZ	YAVAPAI	BAGDAD	35	0.039
54083	EKN	WV	RANDOLPH	ELKINS-RANDOLPH CO-JENN	35	0.039
37017	EYF	NC	BLADEN	CURTIS L BROWN JR FIELD	35	0.039
20105	K71	KS	LINCOLN	LINCOLN MUNI	35	0.039
06047	LSN	CA	MERCED	LOS BANOS MUNI	35	0.039
28017	M44	MS	CHICKASAW	HOUSTON MUNI	35	0.039
13071	MGR	GA	COLQUITT	MOULTRIE MUNI	35	0.039
06105	O54	CA	TRINITY	LONNIE POOL FIELD/WEAVE	35	0.039
04012	P20	AZ	LA PAZ	AVI SUQUILLA	35	0.039
28107	PMU	MS	PANOLA	PANOLA COUNTY	35	0.039
17105	PNT	IL	LIVINGSTON	PONTIAC MUNICIPAL	35	0.039
27043	SBU	MN	FARIBAULT	BLUE EARTH MUNI	35	0.039
04001	SJN	AZ	APACHE	ST JOHNS INDUSTRIAL AIR	35	0.039
17021	TAZ	IL	CHRISTIAN	TAYLORVILLE MUNI	35	0.039
19103	IOW	IA	JOHNSON	IOWA CITY MUNI	35	0.039
29101	RCM	MO	JOHNSON	SKYHAVEN	35	0.039
56037	RKS	WY	SWEETWATER	ROCK SPRINGS-SWEETWATER	35	0.039
42039	GKJ	PA	CRAWFORD	PORT MEADVILLE	35	0.039
26157	CFS	MI	TUSCOLA	TUSCOLA AREA	35	0.038
36061	JRA	NY	NEW YORK	WEST 30TH ST.	35	0.038
16049	S80	ID	IDAHO	IDAHO COUNTY	35	0.038
55095	AHH	WI	POLK	AMERY MUNI	35	0.038
26023	OEB	MI	BRANCH	BRANCH COUNTY MEMORIAL	35	0.038
17101	AJG	IL	LAWRENCE	MOUNT CARMEL MUNI	35	0.038
37191	GWW	NC	WAYNE	GOLDSBORO-WAYNE MUNI	34	0.038
49049	U77	UT	UTAH	SPANISH FORK-SPRINGVILL	34	0.038
28029	M11	MS	COPIAH	COPIAH COUNTY	34	0.038
18153	SIV	IN	SULLIVAN	SULLIVAN COUNTY	34	0.038
30093	BTM	MT	SILVER BOW	BERT MOONEY	34	0.038
47099	2M2	TN	LAWRENCE	LAWRENCEBURG-LAWRENCE C	34	0.038
55033	LUM	WI	DUNN	MENOMONIE MUNICIPAL-SCO	34	0.038
48497	XBP	TX	WISE	BRIDGEPORT MUNI	34	0.037
37091	ASJ	NC	HERTFORD	TRI-COUNTY	34	0.037
37041	EDE	NC	CHOWAN	NORTHEASTERN RGNL	34	0.037
40131	GCM	OK	ROGERS	CLAREMORE RGNL	34	0.037
47043	M02	TN	DICKSON	DICKSON MUNI	34	0.037
17095	GBG	IL	KNOX	GALESBURG MUNI	34	0.037
42055	N68	PA	FRANKLIN	CHAMBERSBURG MUNI	34	0.037
13261	ACJ	GA	SUMTER	SOUTHER FIELD	34	0.037
45031	UDG	SC	DARLINGTON	DARLINGTON COUNTY JETPO	34	0.037
48117	HRX	TX	DEAF SMITH	HEREFORD MUNI	34	0.037
18033	GWB	IN	DE KALB	DE KALB COUNTY	34	0.037
34001	AIY	NJ	ATLANTIC	ATLANTIC CITY MUNI/BADE	34	0.037
06019	M90	CA	FRESNO	MENDOTA	33	0.037
35055	SKX	NM	TAOS	TAOS RGNL	33	0.037
28085	1R7	MS	LINCOLN	BROOKHAVEN-LINCOLN COUN	33	0.037
48291	6R3	TX	LIBERTY	CLEVELAND MUNI	33	0.037

26149	HAI	MI	ST JOSEPH	THREE RIVERS MUNI DR HA	33	0.037
48113	T57	TX	DALLAS	GARLAND/DFW HELOPLEX	33	0.037
48491	T74	TX	WILLIAMSON	TAYLOR MUNI	33	0.037
42003	9G1	PA	ALLEGHENY	ROCK	33	0.037
56013	RIW	WY	FREMONT	RIVERTON REGIONAL	33	0.037
28151	14M	MS	WASHINGTON	HOLLANDALE MUNI	33	0.036
46029	ATY	SD	CODINGTON	WATERTOWN MUNI	33	0.036
45039	FDW	SC	FAIRFIELD	FAIRFIELD COUNTY	33	0.036
37077	HNZ	NC	GRANVILLE	HENDERSON-OXFORD	33	0.036
28099	MPE	MS	NESHOBA	PHILADELPHIA MUNI	33	0.036
06049	O81	CA	MODOC	TULELAKE MUNI	33	0.036
35061	E80	NM	VALENCIA	ALEXANDER MUNI	33	0.036
40021	TQH	OK	CHEROKEE	TAHLEQUAH MUNI	33	0.036
09003	22B	CT	HARTFORD	MOUNTAIN MEADOW AIRSTRI	33	0.036
26007	APN	MI	ALPENA	ALPENA COUNTY REGIONAL	33	0.036
40031	LAW	OK	COMANCHE	LAWTON-FORT SILL REGION	33	0.036
56001	LAR	WY	ALBANY	LARAMIE REGIONAL	33	0.036
06063	2O1	CA	PLUMAS	GANSNER FIELD	33	0.036
26117	6D6	MI	MONTCALM	GREENVILLE MUNI	33	0.036
55003	ASX	WI	ASHLAND	JOHN F KENNEDY MEMORIAL	33	0.036
23027	BST	ME	WALDO	BELFAST MUNI	33	0.036
17197	C56	IL	WILL	SANGER	33	0.036
02270	ENM	AK	WADE HAMPTON	EMMONAK	33	0.036
41059	HRI	OR	UMATILLA	HERMISTON MUNI	33	0.036
17127	M30	IL	MASSAC	METROPOLIS MUNI	33	0.036
37191	W40	NC	WAYNE	MOUNT OLIVE MUNI	33	0.036
37171	ZEF	NC	SURRY	ELKIN MUNI	33	0.036
46135	YKN	SD	YANKTON	CHAN GURNEY MUNI	33	0.036
28087	UBS	MS	LOWNDES	COLUMBUS-LOWNDES COUNTY	33	0.036
44005	UUU	RI	NEWPORT	NEWPORT STATE	32	0.036
30031	WYS	MT	GALLATIN	YELLOWSTONE	32	0.036
48073	JSO	TX	CHEROKEE	CHEROKEE COUNTY	32	0.036
08029	AJZ	CO	DELTA	BLAKE FIELD	32	0.035
21009	GLW	KY	BARREN	GLASGOW MUNI	32	0.035
05009	HRO	AR	BOONE	BOONE COUNTY	32	0.035
27077	BDE	MN	LAKE OF THE WOODS	BAUDETTE INTL	32	0.035
16061	S89	ID	LEWIS	CRAIGMONT MUNI	32	0.035
02070	TOG	AK	BETHEL	TOGIAK	32	0.035
06051	MMH	CA	MONO	MAMMOTH YOSEMITE	32	0.035
25013	13MA	MA	HAMPDEN	METROPOLITAN	32	0.035
53047	0S7	WA	OKANOGAN	DOROTHY SCOTT	32	0.035
53011	1W1	WA	CLARK	GROVE FIELD	32	0.035
48115	2F5	TX	DAWSON	LAMESA MUNI	32	0.035
37163	CTZ	NC	SAMPSON	SAMPSON COUNTY	31	0.035
27161	ACQ	MN	WASECA	WASECA MUNI	31	0.035
02201	AQC	AK	PRINCE OF WALES	KLAWOCK	31	0.035
55043	PVB	WI	GRANT	PLATTEVILLE MUNICIPAL	31	0.035
55129	SSQ	WI	WASHBURN	SHELL LAKE MUNI	31	0.035

32023	TPH	NV	NYE	TONOPAH	31	0.035
42037	N13	PA	COLUMBIA	BLOOMSBURG MUNI	31	0.035
55023	PDC	WI	CRAWFORD	PRAIRIE DU CHIEN MUNI	31	0.034
32021	HTH	NV	MINERAL	HAWTHORNE MUNI	31	0.034
48227	BPG	TX	HOWARD	Big Spring Mcmahon	31	0.034
48231	7F3	TX	HUNT	CADDO MILLS MUNI	31	0.034
39089	VTA	OH	LICKING	NEWARK-HEATH	31	0.034
27085	HCD	MN	MC LEOD	HUTCHINSON MUNI-BUTLER	31	0.034
55083	OCQ	WI	OCONTO	OCONTO MUNI	31	0.034
55053	BCK	WI	JACKSON	BLACK RIVER FALLS AREA	31	0.034
28145	M72	MS	UNION	NEW ALBANY-UNION CO	31	0.034
28017	5A4	MS	CHICKASAW	OKOLONA MUNI-RICHARD ST	31	0.034
48503	RPH	TX	YOUNG	GRAHAM MUNI	31	0.034
55093	RGK	MN	PIERCE	RED WING RGNL	31	0.034
20045	LWC	KS	DOUGLAS	LAWRENCE MUNI	31	0.034
48165	GNC	TX	GAINES	GAINES COUNTY	31	0.034
29071	K39	MO	FRANKLIN	ST CLAIR REGIONAL	31	0.034
02201	HYG	AK	PRINCE OF WALES	HYDABURG	31	0.034
13017	FZG	GA	BEN HILL	FITZGERALD MUNI	31	0.034
53005	S40	WA	BENTON	PROSSER	31	0.034
18079	OVO	IN	JENNINGS	NORTH VERNON	31	0.034
31141	OLU	NE	PLATTE	COLUMBUS MUNI	31	0.034
47011	HDI	TN	BRADLEY	HARDWICK FIELD	31	0.034
27137	DYT	MN	ST LOUIS	SKY HARBOR	30	0.033
21093	EKX	KY	HARDIN	ADDINGTON FIELD	30	0.033
48221	GDJ	TX	HOOD	GRANBURY MUNI	30	0.033
47047	FYE	TN	FAYETTE	FAYETTE COUNTY	30	0.033
28053	1M2	MS	HUMPHREYS	BELZONI MUNI	30	0.033
06055	2O3	CA	NAPA	ANGWIN-PARRETT FIELD	30	0.033
36029	4G2	NY	ERIE	HAMBURG INC	30	0.033
13039	4J6	GA	CAMDEN	ST MARYS	30	0.033
05021	7M7	AR	CLAY	PIGGOTT MUNI	30	0.033
33007	BML	NH	COOS	BERLIN MUNI	30	0.033
40113	BVO	OK	OSAGE	BARTLESVILLE MUNI	30	0.033
05103	CDH	AR	OUACHITA	HARRELL FIELD	30	0.033
13205	CXU	GA	MITCHELL	CAMILLA-MITCHELL COUNTY	30	0.033
13297	D73	GA	WALTON	MONROE-WALTON COUNTY	30	0.033
42033	FIG	PA	CLEARFIELD	CLEARFIELD-LAWRENCE	30	0.033
17137	IJX	IL	MORGAN	JACKSONVILLE MUNI	30	0.033
28093	M41	MS	MARSHALL	HOLLY SPRINGS-MARSHALL	30	0.033
06107	O42	CA	TULARE	WOODLAKE	30	0.033
06107	D86	CA	TULARE	SEQUOIA FIELD	30	0.033
53075	S94	WA	WHITMAN	WHITMAN CO MEMORIAL	30	0.033
12017	X40	FL	CITRUS	INVERNESS	30	0.033
12025	X46	FL	MIAMI-DADE	OPA LOCKA WEST	30	0.033
17073	EZI	IL	HENRY	KEWANEE MUNI	30	0.033
22019	CWF	LA	CALCASIEU	CHENNAULT INTL	30	0.033
47185	SRB	TN	WHITE	UPPER CUMBERLAND RGNL	30	0.033

45005	88J	SC	ALLENDALE	ALLENDALE COUNTY	30	0.033
04009	SAD	AZ	GRAHAM	SAFFORD REGIONAL	30	0.033
39137	OWX	OH	PUTNAM	PUTNAM COUNTY	30	0.033
39051	USE	OH	FULTON	FULTON COUNTY	30	0.033
31151	CEK	NE	SALINE	CRETE MUNICIPAL	30	0.033
17031	CGX	IL	COOK	MERRILL C MEIGS	30	0.033
21035	CEY	KY	CALLOWAY	KYLE-OAKLEY FIELD	30	0.033
17141	RPJ	IL	OGLE	ROCHELLE MUNI AIRPORT-K	30	0.033
32015	BAM	NV	LANDER	BATTLE MOUNTAIN	30	0.033
36043	6B4	NY	HERKIMER	FRANKFORT-HIGHLAND	30	0.033
17165	HSB	IL	SALINE	HARRISBURG-RALEIGH	30	0.033
55111	LNR	WI	SAUK	TRI-COUNTY REGIONAL	30	0.033
39123	3W2	OH	OTTAWA	PUT IN BAY	30	0.033
29049	EZZ	MO	CLINTON	CAMERON MEMORIAL	30	0.033
48203	ASL	TX	HARRISON	HARRISON COUNTY	29	0.032
34037	13N	NJ	SUSSEX	TRINCA	29	0.032
47165	1M5	TN	SUMNER	PORTLAND MUNI	29	0.032
06073	L08	CA	SAN DIEGO	BORREGO VALLEY	29	0.032
02150	ADQ	AK	KODIAK	KODIAK	29	0.032
08043	1V6	CO	FREMONT	FREMONT COUNTY	29	0.032
41071	2S6	OR	YAMHILL	SPORTSMAN AIRPARK	29	0.032
01039	79J	AL	COVINGTON	ANDALUSIA-OPP	29	0.032
35031	GUP	NM	MC KINLEY	GALLUP MUNICIPAL	29	0.032
42065	DUJ	PA	JEFFERSON	DU BOIS-JEFFERSON COUNT	29	0.032
39067	8G6	OH	HARRISON	HARRISON COUNTY	29	0.032
28023	23M	MS	CLARKE	CLARKE COUNTY	29	0.032
20127	HRU	KS	MORRIS	HERINGTON REGIONAL	29	0.032
16035	S68	ID	CLEARWATER	OROFINO MUNI	29	0.032
47157	NQA	TN	SHELBY	MILLINGTON MUNI	29	0.032
19035	CKP	IA	CHEROKEE	CHEROKEE MUNI	29	0.032
48255	2R9	TX	KARNES	KARNES COUNTY	29	0.032
16003	U82	ID	ADAMS	COUNCIL MUNI	29	0.032
37113	1A5	NC	MACON	MACON COUNTY	29	0.032
48487	F05	TX	WILBARGER	WILBARGER COUNTY	29	0.032
22103	L31	LA	ST TAMMANY	GREATER ST. TAMMANY	29	0.032
27023	MVE	MN	CHIPPEWA	MONTEVIDEO-CHIPPEWA COU	29	0.032
51155	PSK	VA	PULASKI	NEW RIVER VALLEY	29	0.032
12051	2IS	FL	HENDRY	AIRGLADES	29	0.032
40049	PVJ	OK	GARVIN	PAULS VALLEY MUNI	29	0.032
48497	LUD	TX	WISE	DECATUR MUNI	29	0.032
40137	DUC	OK	STEPHENS	HALLIBURTON FIELD	29	0.032
28043	GNF	MS	GRENADA	GRENADA MUNI	29	0.031
47085	0M5	TN	HUMPHREYS	HUMPHREYS COUNTY	29	0.031
30091	PWD	MT	SHERIDAN	SHER-WOOD	29	0.031
08083	CEZ	CO	MONTEZUMA	CORTEZ MUNI	28	0.031
56013	LND	WY	FREMONT	HUNT FIELD	28	0.031
26149	IRS	MI	ST JOSEPH	KIRSCH MUNI	28	0.031
13233	4A4	GA	POLK	CORNELIUS-MOORE FIELD	28	0.031

37093	5W4	NC	HOKE	P K AIRPARK	28	0.031
55019	VIQ	WI	CLARK	NEILLSVILLE MUNI	28	0.031
01089	M38	AL	MADISON	HAZEL GREEN	28	0.031
48253	F56	TX	JONES	ARLEDGE FIELD	28	0.031
02164	ILI	AK	BRISTOL BAY	ILIAMNA	28	0.031
26059	JYM	MI	HILLSDALE	HILLSDALE MUNI	28	0.031
55125	LNL	WI	VILAS	KINGS LAND O' LAKES	28	0.031
48069	T55	TX	CASTRO	DIMMITT MUNI	28	0.031
26057	AMN	MI	GRATIOT	GRATIOT COMMUNITY	28	0.031
02185	SCC	AK	NORTH SLOPE	DEADHORSE	28	0.031
41001	BKE	OR	BAKER	BAKER CITY MUNICIPAL	28	0.031
53007	8S2	WA	CHELAN	CASHMERE-DRYDEN	28	0.031
46059	MKA	SD	HAND	MILLER MUNI	28	0.031
47143	2A0	TN	RHEA	MARK ANTON	28	0.031
28131	M24	MS	STONE	DEAN GRIFFIN MEMORIAL	28	0.031
16009	S72	ID	BENEWAH	ST MARIES MUNI	28	0.031
12031	VQQ	FL	DUVAL	CECIL FIELD	28	0.031
55049	MRJ	WI	IOWA	IOWA COUNTY	28	0.031
48361	ORG	TX	ORANGE	ORANGE COUNTY	28	0.031
21107	2I0	KY	HOPKINS	MADISONVILLE MUNI	28	0.030
53025	3W7	WA	GRANT	GRAND COULEE DAM	28	0.030
36031	4B6	NY	ESSEX	TICONDEROGA MUNI	28	0.030
13027	4J5	GA	BROOKS	QUITMAN BROOKS COUNTY	28	0.030
30057	EKS	MT	MADISON	ENNIS - BIG SKY	28	0.030
45023	DCM	SC	CHESTER	CHESTER MUNI	28	0.030
40123	ADH	OK	PONTOTOC	ADA MUNI	28	0.030
35047	LVS	NM	SAN MIGUEL	LAS VEGAS MUNI	28	0.030
05037	M65	AR	CROSS	WYNNE MUNI	28	0.030
36019	PLB	NY	CLINTON	CLINTON CO	28	0.030
48445	BFE	TX	TERRY	TERRY COUNTY	28	0.030
28147	T36	MS	WALTHALL	PAUL PITTMAN MEMORIAL	28	0.030
35051	TCS	NM	SIERRA	TRUTH OR CONSEQUENCES M	28	0.030
06029	TSP	CA	KERN	TEHACHAPI MUNI	28	0.030
29037	LRY	MO	CASS	LAWRENCE SMITH MEMORIAL	28	0.030
01079	9A4	AL	LAWRENCE	LAWRENCE COUNTY	27	0.030
06097	O60	CA	SONOMA	CLOVERDALE MUNI	27	0.030
55005	UBE	WI	BARRON	CUMBERLAND MUNI	27	0.030
40019	1F0	OK	CARTER	ARDMORE DOWNTOWN EXECUT	27	0.030
55055	61C	WI	JEFFERSON	FORT ATKINSON MUNI	27	0.030
44009	OQU	RI	WASHINGTON	QUONSET STATE	27	0.030
28139	25M	MS	TIPPAH	RIPLEY	27	0.030
20111	EMP	KS	LYON	EMPORIA MUNI	27	0.030
31155	AHQ	NE	SAUNDERS	WAHOO MUNI	27	0.030
27117	PQN	MN	PIPESTONE	PIPESTONE MUNI	27	0.030
47005	0M4	TN	BENTON	BENTON COUNTY	27	0.030
28101	M23	MS	NEWTON	JAMES H EASOM FIELD	27	0.030
29195	MHL	MO	SALINE	MARSHALL MEML MUNI	27	0.030
38089	DIK	ND	STARK	DICKINSON MUNI	27	0.030

16049	S73	ID	IDAHO	KAMIAH MUNI	27	0.030
26045	FPK	MI	EATON	FITCH H BEACH	27	0.030
26009	ACB	MI	ANTRIM	ANTRIM COUNTY	27	0.029
18169	IWH	IN	WABASH	WABASH MUNI	27	0.029
48153	41F	TX	FLOYD	FLOYDADA MUNICIPAL	27	0.029
47133	8A3	TN	OVERTON	LIVINGSTON MUNI	26	0.029
37153	RCZ	NC	RICHMOND	ROCKINGHAM-HAMLET	26	0.029
35015	ATS	NM	EDDY	ARTESIA MUNI	26	0.029
13001	BHC	GA	APPLING	BAXLEY MUNI	26	0.029
06065	BNG	CA	RIVERSIDE	BANNING MUNI	26	0.029
37047	CPC	NC	COLUMBUS	COLUMBUS COUNTY MUNI	26	0.029
48141	E35	TX	EL PASO	FABENS	26	0.029
06071	EED	CA	SAN BERNARDINO	NEEDLES	26	0.029
05147	M60	AR	WOODRUFF	WOODRUFF COUNTY	26	0.029
02122	SWD	AK	SEWARD	SEWARD	26	0.029
33019	CNH	NH	SULLIVAN	CLAREMONT MUNI	26	0.029
41057	TMK	OR	TILLAMOOK	TILLAMOOK	26	0.029
28113	MCB	MS	PIKE	MC COMB/PIKE COUNTY/JOH	26	0.029
06035	SVE	CA	LASSEN	SUSANVILLE MUNI	26	0.029
33005	AFN	NH	CHESHIRE	JAFFREY AIRPORT-SILVER	26	0.029
23003	CAR	ME	AROOSTOOK	CARIBOU MUNI	26	0.029
18049	RCR	IN	FULTON	FULTON COUNTY	26	0.029
30031	9S5	MT	GALLATIN	THREE FORKS	26	0.029
20187	2K3	KS	STANTON	STANTON COUNTY MUNI	26	0.029
28117	8M1	MS	PRENTISS	BOONEVILLE/BALDWYN	26	0.029
36103	23N	NY	SUFFOLK	BAYPORT AERODROME	26	0.028
30001	DLN	MT	BEAVERHEAD	DILLON	26	0.028
06029	L05	CA	KERN	KERN VALLEY	26	0.028
30081	32S	MT	RAVALLI	STEVENSVILLE	26	0.028
05027	AGO	AR	COLUMBIA	MAGNOLIA MUNI	26	0.028
26063	BAX	MI	HURON	HURON COUNTY MEMORIAL	26	0.028
21157	M34	KY	MARSHALL	KENTUCKY DAM STATE PARK	26	0.028
13277	TMA	GA	TIFT	HENRY TIFT MYERS	26	0.028
01133	1M4	AL	WINSTON	POSEY FIELD	26	0.028
47053	M53	TN	GIBSON	HUMBOLDT MUNI	26	0.028
06093	SIY	CA	SISKIYOU	SISKIYOU COUNTY	26	0.028
23007	8B0	ME	FRANKLIN	STEVEN A. BEAN MUNI	25	0.028
29131	AIZ	MO	MILLER	LEE C FINE MEMORIAL	25	0.028
36029	BQR	NY	ERIE	BUFFALO-LANCASTER	25	0.028
51139	W45	VA	PAGE	LURAY CAVERNS	25	0.028
36037	5G0	NY	GENESEE	LE ROY	25	0.028
20067	ULS	KS	GRANT	ULYSSES	25	0.028
16011	U36	ID	BINGHAM	ABERDEEN MUNI	25	0.028
18023	FKR	IN	CLINTON	FRANKFORT MUNI	25	0.028
39171	0G6	OH	WILLIAMS	WILLIAMS COUNTY	25	0.028
55007	3CU	WI	BAYFIELD	CABLE UNION	25	0.028
30111	6S8	MT	YELLOWSTONE	LAUREL MUNI	25	0.028
55067	AIG	WI	LANGLADE	LANGLADE COUNTY	25	0.028

38077	BWP	ND	RICHLAND	HARRY STERN	25	0.028
17025	FOA	IL	CLAY	FLORA MUNI	25	0.028
13251	JYL	GA	SCREVEN	PLANTATION ARPK	25	0.028
06029	L17	CA	KERN	TAFT-KERN COUNTY	25	0.028
06029	L19	CA	KERN	WASCO-KERN COUNTY	25	0.028
06079	L52	CA	SAN LUIS OBISPO	OCEANO COUNTY	25	0.028
05059	M78	AR	HOT SPRING	MALVERN MUNI	25	0.028
13009	MLJ	GA	BALDWIN	BALDWIN COUNTY	25	0.028
13303	OKZ	GA	WASHINGTON	KAOLIN FIELD	25	0.028
02180	OME	AK	NOME	NOME	25	0.028
06019	F34	CA	FRESNO	FIREBAUGH	25	0.028
56007	RWL	WY	CARBON	RAWLINS MUNI	25	0.028
27049	SYN	MN	GOODHUE	STANTON AIRFIELD	25	0.028
48291	T78	TX	LIBERTY	LIBERTY MUNI	25	0.028
06027	L06	CA	INYO	FURNACE CREEK	25	0.028
29071	UUV	MO	FRANKLIN	SULLIVAN REGIONAL	25	0.028
17183	DNV	IL	VERMILION	VERMILION COUNTY	25	0.028
27017	COQ	MN	CARLTON	CLOQUET CARLTON COUNTY	25	0.027
37009	GEV	NC	ASHE	ASHE COUNTY	25	0.027
39013	6G5	OH	BELMONT	BARNESVILLE-BRADFIELD	25	0.027
47111	3M7	TN	MACON	LAFAYETTE MUNI	25	0.027
45059	LUX	SC	LAURENS	LAURENS COUNTY	25	0.027
47109	SZY	TN	MC NAIRY	ROBERT SIBLEY	25	0.027
51800	SFQ	VA	SUFFOLK	SUFFOLK MUNI	25	0.027
31013	AIA	NE	BOX BUTTE	ALLIANCE MUNI	25	0.027
19015	BNW	IA	BOONE	BOONE MUNI	25	0.027
06023	O19	CA	HUMBOLDT	KNEELAND	25	0.027
27105	OTG	MN	NOBLES	WORTHINGTON MUNI	24	0.027
37141	ACZ	NC	PENDER	HENDERSON FIELD	24	0.027
21089	DWU	KY	GREENUP	ASHLAND-BOYD COUNTY	24	0.027
21193	K20	KY	PERRY	WENDELL H FORD	24	0.027
48001	PSN	TX	ANDERSON	PALESTINE MUNI	24	0.027
41031	S33	OR	JEFFERSON	CITY-COUNTY	24	0.027
08015	ANK	CO	CHAFFEE	HARRIET ALEXANDER FIELD	24	0.027
48477	11R	TX	WASHINGTON	BRENHAM MUNI	24	0.027
17135	3LF	IL	MONTGOMERY	LITCHFIELD MUNI	24	0.027
48307	BBD	TX	MC CULLOCH	CURTIS FIELD	24	0.027
26101	MBL	MI	MANISTEE	MANISTEE CO.-BLACKER	24	0.027
27159	SAZ	MN	WADENA	STAPLES MUNI	24	0.027
48409	T69	TX	SAN PATRICIO	SAN PATRICIO COUNTY	24	0.027
48223	SLR	TX	HOPKINS	SULPHUR SPRINGS MUNI	24	0.027
27169	ONA	MN	WINONA	WINONA MUNI-MAX CONRAD	24	0.026
47071	SNH	TN	HARDIN	SAVANNAH-HARDIN COUNTY	24	0.026
26143	HTL	MI	ROSCOMMON	ROSCOMMON COUNTY	24	0.026
55123	Y51	WI	VERNON	VIROQUA MUNI	24	0.026
48179	PPA	TX	GRAY	PERRY LEFORS FIELD	24	0.026
50017	2B9	VT	ORANGE	POST MILLS	24	0.026
13157	19A	GA	JACKSON	JACKSON COUNTY	24	0.026

13023	48A	GA	BLECKLEY	COCHRAN	24	0.026
22001	4R7	LA	ACADIA	EUNICE	24	0.026
22011	DRI	LA	BEAUREGARD	BEAUREGARD PARISH	24	0.026
48303	F49	TX	LUBBOCK	SLATON MUNI	24	0.026
22111	F87	LA	UNION	UNION PARISH	24	0.026
36035	NY0	NY	FULTON	FULTON COUNTY	24	0.026
29053	VER	MO	COOPER	JESSE VIERTEL MEMORIAL	24	0.026
09003	4B9	CT	HARTFORD	SIMSBURY	24	0.026
16079	S83	ID	SHOSHONE	SHOSHONE COUNTY	24	0.026
39133	29G	OH	PORTAGE	PORTAGE COUNTY	24	0.026
44009	BID	RI	WASHINGTON	BLOCK ISLAND STATE	23	0.026
30017	MLS	MT	CUSTER	FRANK WILEY FIELD	23	0.026
21097	0I8	KY	HARRISON	CYNTHIANA-HARRISON COUN	23	0.026
48273	IKG	TX	KLEBERG	KLEBERG COUNTY	23	0.026
53043	2S8	WA	LINCOLN	WILBUR	23	0.026
21217	AAS	KY	TAYLOR	TAYLOR COUNTY	23	0.026
48197	F01	TX	HARDEMAN	QUANAH MUNI	23	0.026
27021	Y49	MN	CASS	WALKER MUNI	23	0.026
08045	RIL	CO	GARFIELD	GARFIELD COUNTY REGIONA	23	0.026
16023	AOC	ID	BUTTE	ARCO-BUTTE COUNTY	23	0.026
42117	N38	PA	TIOGA	GRAND CANYON STATE	23	0.026
56023	AFO	WY	LINCOLN	AFTON MUNI	23	0.025
49037	BDG	UT	SAN JUAN	BLANDING MUNI	23	0.025
50027	VSF	VT	WINDSOR	HARTNESS STATE (SPRINGF	23	0.025
06023	0Q5	CA	HUMBOLDT	SHELTER COVE	23	0.025
48277	PRX	TX	LAMAR	COX FLD	23	0.025
18181	MCX	IN	WHITE	WHITE COUNTY	23	0.025
06037	PMD	CA	LOS ANGELES	PALMDALE PRODN FLT/TEST	23	0.025
26069	OSC	MI	IOSCO	OSCODA-WURTSMITH	23	0.025
27135	RRT	MN	ROSEAU	WARROAD INTL-SWEDE CARL	23	0.025
01095	8A1	AL	MARSHALL	GUNTERSVILLE MUNI	23	0.025
36067	6B9	NY	ONONDAGA	SKANEATELES AERO DROME	23	0.025
55103	93C	WI	RICHLAND	RICHLAND	23	0.025
39039	DFI	OH	DEFIANCE	DEFIANCE MEML	23	0.025
40035	H04	OK	CRAIG	VINITA MUNI	23	0.025
37055	HSE	NC	DARE	BILLY MITCHELL	23	0.025
54023	W99	WV	GRANT	GRANT COUNTY	23	0.025
20009	GBD	KS	BARTON	GREAT BEND MUNI	23	0.025
29145	EOS	MO	NEWTON	NEOSHO HUGH ROBINSON	23	0.025
31047	CZD	NE	DAWSON	COZAD MUNI	23	0.025
39037	VES	OH	DARKE	DARKE COUNTY	23	0.025
36101	7N1	NY	STEUBEN	CORNING-PAINTED POST	23	0.025
31001	HSI	NE	ADAMS	HASTINGS MUNI	23	0.025
22029	0R4	LA	CONCORDIA	CONCORDIA PARISH	23	0.025
22031	3F3	LA	DE SOTO	DE SOTO PARISH	23	0.025
36001	4B0	NY	ALBANY	SOUTH ALBANY	23	0.025
48023	60F	TX	BAYLOR	SEYMOUR MUNICIPAL	23	0.025
46023	AGZ	SD	CHARLES MIX	WAGNER MUNI	23	0.025

05029	BDQ	AR	CONWAY	MORRILTON MUNI	23	0.025
40149	CSM	OK	WASHITA	CLINTON-SHERMAN	23	0.025
23029	EPM	ME	WASHINGTON	EASTPORT MUNI	23	0.025
48401	F12	TX	RUSK	RUSK COUNTY	23	0.025
06073	L32	LA	CATAHOULA	JONESVILLE	23	0.025
17159	OLY	IL	RICHLAND	OLNEY-NOBLE	23	0.025
41013	S39	OR	CROOK	PRINEVILLE	23	0.025
27051	Y63	MN	GRANT	ELBOW LAKE MUNI	23	0.025
32033	ELY	NV	WHITE PINE	ELY ARPT /YELLAND FLD/	22	0.025
21179	BRY	KY	NELSON	SAMUELS FIELD	22	0.025
26051	GDW	MI	GLADWIN	GLADWIN ZETTEL MEMORIAL	22	0.025
55137	Y50	WI	WAUSHARA	WAUTOMA MUNI	22	0.025
56007	SAA	WY	CARBON	SHIVELY FIELD	22	0.025
02060	AKN	AK	BRISTOL BAY	KING SALMON	22	0.025
18041	CEV	IN	FAYETTE	METTEL FIELD	22	0.025
29023	POF	MO	BUTLER	POPLAR BLUFF MUNICIPAL	22	0.024
19101	FFL	IA	JEFFERSON	FAIRFIELD MUNI	22	0.024
31089	ONL	NE	HOLT	THE O'NEILL MUNI-JOHN L	22	0.024
55029	3D2	WI	DOOR	EPHRAIM-FISH CREEK	22	0.024
02261	CKU	AK	CORDOVA-MCCARTHY	CORDOVA MUNI	22	0.024
06073	L18	CA	SAN DIEGO	FALLBROOK COMMUNITY AIR	22	0.024
30087	1S3	MT	ROSEBUD	TILLITT FIELD	22	0.024
04011	CFT	AZ	GREENLEE	GREENLEE COUNTY	22	0.024
30005	S71	MT	BLAINE	EDGAR G OBIE	22	0.024
08071	TAD	CO	LAS ANIMAS	PERRY STOKES	22	0.024
06103	0O4	CA	TEHAMA	CORNING MUNI	22	0.024
41033	3S4	OR	JOSEPHINE	ILLINOIS VALLEY	22	0.024
48481	ARM	TX	WHARTON	WHARTON RGNL	22	0.024
48083	COM	TX	COLEMAN	COLEMAN MUNI	22	0.024
17041	K96	IL	DOUGLAS	TUSCOLA	22	0.024
48171	T82	TX	GILLESPIE	GILLESPIE COUNTY	22	0.024
16017	1S6	ID	BONNER	PRIEST RIVER MUNI	22	0.024
16085	U70	ID	VALLEY	CASCADE	22	0.024
40133	SRE	OK	SEMINOLE	SEMINOLE MUNI	22	0.024
27027	04Y	MN	CLAY	HAWLEY MUNI	22	0.024
30067	29S	MT	PARK	GARDINER	22	0.024
26099	57D	MI	MACOMB	RAY COMMUNITY	22	0.024
45081	6J4	SC	SALUDA	SALUDA COUNTY	22	0.024
56021	82V	WY	LARAMIE	PINE BLUFFS MUNI	22	0.024
28005	C71	MS	AMITE	CROSBY MUNICIPAL	22	0.024
42001	W05	PA	ADAMS	GETTYSBURG AIRPORT AND	22	0.024
20113	MPR	KS	MC PHERSON	MC PHERSON	22	0.024
48233	BGD	TX	HUTCHINSON	HUTCHINSON COUNTY	21	0.024
01001	1A9	AL	AUTAUGA	AUTAUGA COUNTY	21	0.024
23019	1B0	ME	PENOBSCOT	DEXTER REGIONAL	21	0.024
21141	4M7	KY	LOGAN	RUSSELLVILLE-LOGAN COUN	21	0.024
53041	55S	WA	LEWIS	PACKWOOD	21	0.024
37057	EXX	NC	DAVIDSON	DAVIDSON COUNTY	21	0.024

40111	F10	OK	OKMULGEE	HENRYETTA MUNI	21	0.024
36033	MAL	NY	FRANKLIN	MALONE-DUFORT	21	0.024
06027	O26	CA	INYO	LONE PINE	21	0.024
21195	PBX	KY	PIKE	PIKE COUNTY-HATCHER FIE	21	0.024
18075	PLD	IN	JAY	PORTLAND MUNI	21	0.024
40125	SNL	OK	POTTAWATOMIE	SHAWNEE MUNI	21	0.024
29229	1MO	MO	WRIGHT	MOUNTAIN GROVE MEMORIAL	21	0.023
02280	WRG	AK	WRANGELL-PETERSBURG	WRANGELL	21	0.023
01061	33J	AL	GENEVA	GENEVA MUNI	21	0.023
18003	SMD	IN	ALLEN	SMITH FIELD	21	0.023
08015	AEJ	CO	CHAFFEE	CENTRAL COLORADO REGION	21	0.023
01003	1R8	AL	BALDWIN	BAY MINETTE MUNI	21	0.023
36099	0G7	NY	SENECA	FINGER LAKES REGIONAL	21	0.023
36061	6N7	NY	NEW YORK	NEW YORK SKYPORTS INC	21	0.023
27133	LYV	MN	ROCK	QUENTIN AANENSON FIELD	21	0.023
48449	MSA	TX	Titus	Mount Pleasant Municipa	21	0.023
12059	1J0	FL	HOLMES	TRI-COUNTY	21	0.023
34033	7N7	NJ	SALEM	SPITFIRE AERODROME	21	0.023
17003	CIR	IL	ALEXANDER	CAIRO RGNL	21	0.023
27119	FSE	MN	POLK	FOSSTON MUNI	21	0.023
20037	PTS	KS	CRAWFORD	ATKINSON MUNI	21	0.023
39091	7I7	OH	LOGAN	BELLEFONTAINE MUNI	21	0.023
48239	26R	TX	JACKSON	JACKSON COUNTY	21	0.023
21225	TWT	KY	UNION	STURGIS MUNI	21	0.023
27033	MWM	MN	COTTONWOOD	WINDOM MUNI	21	0.023
46025	8D7	SD	CLARK	CLARK COUNTY	21	0.023
40153	WWR	OK	WOODWARD	WEST WOODWARD	21	0.023
53043	43D	WA	LINCOLN	ODESSA MUNI	21	0.023
48067	ATA	TX	CASS	HALL-MILLER MUNI	21	0.023
12049	CHN	FL	HARDEE	WAUCHULA MUNI	21	0.023
18027	DCY	IN	DAVIESS	DAVIESS COUNTY	21	0.023
51187	FRR	VA	WARREN	FRONT ROYAL-WARREN COUN	21	0.023
48371	FST	TX	PECOS	FORT STOCKTON-PECOS COU	21	0.023
48357	PYX	TX	OCHILTREE	PERRYTON OCHILTREE COUN	21	0.023
04021	MZJ	AZ	PINAL	PINAL AIRPARK	21	0.023
49045	ENV	UT	TOOELE	WENDOVER	21	0.023
21231	EKQ	KY	WAYNE	WAYNE COUNTY	20	0.023
30101	SBX	MT	TOOLE	SHELBY	20	0.023
06093	A30	CA	SISKIYOU	SCOTT VALLEY	20	0.022
48355	RBO	TX	NUECES	NUECES COUNTY	20	0.022
19139	MUT	IA	MUSCATINE	MUSCATINE MUNI	20	0.022
20005	K59	KS	ATCHISON	AMELIA EARHART	20	0.022
20059	OWI	KS	FRANKLIN	OTTAWA MUNI	20	0.022
47039	0M1	TN	DECATUR	SCOTT FIELD	20	0.022
26145	50G	MI	SAGINAW	HOWARD NIXON MEMORIAL	20	0.022
55033	3T3	WI	DUNN	BOYCEVILLE MUNI	20	0.022
08103	EEO	CO	RIO BLANCO	MEEKER	20	0.022
55107	RCX	WI	RUSK	RUSK COUNTY	20	0.022

26153	ISQ	MI	SCHOOLCRAFT	SCHOOLCRAFT COUNTY	20	0.022
36111	20N	NY	ULSTER	KINGSTON-ULSTER	20	0.022
13163	2J3	GA	JEFFERSON	LOUISVILLE MUNI	20	0.022
28123	2M4	MS	SCOTT	G. V. MONTGOMERY	20	0.022
05141	CCA	AR	VAN BUREN	CLINTON MUNI	20	0.022
54001	79D	WV	BARBOUR	PHILIPPI/BARBOUR COUNTY	20	0.022
17191	FWC	IL	WAYNE	FAIRFIELD MUNI	20	0.022
28159	LMS	MS	WINSTON	LOUISVILLE WINSTON COUN	20	0.022
08065	LXV	CO	LAKE	LAKE COUNTY	20	0.022
20117	MYZ	KS	MARSHALL	MARYSVILLE MUNI	20	0.022
42033	N97	NC	DAVIDSON	HIATT	20	0.022
30009	RED	MT	CARBON	RED LODGE	20	0.022
20171	TQK	KS	SCOTT	SCOTT CITY MUNI	20	0.022
29029	K15	MO	CAMDEN	GRAND GLAIZE- OSAGE BEA	20	0.022
16073	S66	ID	OWYHEE	HOMEDALE MUNI	20	0.022
55135	CLI	WI	WAUPACA	CLINTONVILLE MUNI	20	0.022
47151	SCX	TN	SCOTT	SCOTT MUNI	20	0.022
17023	1H8	IL	CLARK	CASEY MUNI	20	0.022
30095	6S3	MT	STILLWATER	COLUMBUS	20	0.022
17055	H96	IL	FRANKLIN	BENTON MUNI	20	0.022
42027	PSB	PA	CENTRE	MID-STATE	20	0.022
27129	1D6	MN	RENVILLE	HECTOR MUNI	20	0.022
02280	63A	AK	WRANGELL-PETERSBURG	LLOYD R. ROUNDTREE SEAP	20	0.022
13275	TVI	GA	THOMAS	THOMASVILLE MUNI	20	0.022
20191	EGT	KS	SUMNER	WELLINGTON MUNI	20	0.022
22035	0M8	LA	EAST CARROLL	BYERLEY	20	0.022
48149	3T5	TX	FAYETTE	FAYETTE REGIONAL AIR CE	20	0.022
38003	6D8	ND	BARNES	BARNES COUNTY MUNI	20	0.022
13131	70J	GA	GRADY	CAIRO-GRADY COUNTY	20	0.022
48349	CRS	TX	NAVARRO	C DAVID CAMPBELL FIELD-	20	0.022
36017	N23	NY	DELAWARE	SIDNEY MUNI	20	0.022
48105	OZA	TX	CROCKETT	OZONA MUNI	20	0.022
27025	ROS	MN	CHISAGO	RUSH CITY RGNL	20	0.022
48415	SNK	TX	SCURRY	WINSTON FIELD	20	0.022
39099	4G3	OH	MAHONING	MILLER	20	0.022
18175	I83	IN	WASHINGTON	SALEM MUNI	20	0.021
56015	TOR	WY	GOSHEN	TORRINGTON MUNI	19	0.021
01071	4A6	AL	JACKSON	SCOTTSBORO MUNI-WORD FI	19	0.021
08063	ITR	CO	KIT CARSON	KIT CARSON COUNTY	19	0.021
55015	8D1	WI	CALUMET	NEW HOLSTEIN MUNI	19	0.021
35053	ONM	NM	SOCORRO	SOCORRO MUNI	19	0.021
38059	Y19	ND	MORTON	MANDAN MUNI	19	0.021
44009	WST	RI	WASHINGTON	WESTERLY STATE	19	0.021
16007	1U7	ID	BEAR LAKE	BEAR LAKE COUNTY	19	0.021
27111	FFM	MN	OTTER TAIL	FERGUS FALLS MUNI-EINAR	19	0.021
41015	BOK	OR	CURRY	BROOKINGS	19	0.021
39147	FZI	OH	SENECA	FOSTORIA METROPOLITAN	19	0.021
48207	15F	TX	HASKELL	HASKELL MUNI	19	0.021

28025	M83	MS	CLAY	MCCHAREN FIELD	19	0.021
53047	S52	WA	OKANOGAN	METHOW VALLEY STATE	19	0.021
29187	FAM	MO	ST FRANCOIS	FARMINGTON REGIONAL	19	0.021
29027	FTT	MO	CALLAWAY	ELTON HENSLEY MEMORIAL	19	0.021
30047	8S1	MT	LAKE	POLSON	19	0.021
02290	CHP	AK	UPPER YUKON	CIRCLE HOT SPRINGS	19	0.021
26005	61D	MI	ALLEGAN	PLAINWELL MUNICIPAL	19	0.021
56019	BYG	WY	JOHNSON	JOHNSON COUNTY	19	0.021
26081	8D4	MI	KENT	PAUL C. MILLER-SPARTA	19	0.021
40113	2F6	OK	OSAGE	SKIATOOK MUNI	19	0.021
13269	6A1	GA	TAYLOR	BUTLER MUNI	19	0.021
05053	9M8	AR	GRANT	SHERIDAN MUNI	19	0.021
40151	AVK	OK	WOODS	ALVA RGNL	19	0.021
06015	CEC	CA	DEL NORTE	JACK MC NAMARA FIELD	19	0.021
48419	F17	TX	SHELBY	CENTER MUNI	19	0.021
40103	F22	OK	NOBLE	PERRY MUNI	19	0.021
31053	FET	NE	DODGE	FREMONT MUNI	19	0.021
55119	MDZ	WI	TAYLOR	TAYLOR COUNTY	19	0.021
42065	N35	PA	JEFFERSON	PUNXSUTAWNEY MUNI	19	0.021
48389	PEQ	TX	REEVES	PECOS MUNI	19	0.021
13145	PIM	GA	HARRIS	CALLAWAY GARDENS-HARRIS	19	0.021
26031	SLH	MI	CHEBOYGAN	CHEBOYGAN COUNTY	19	0.021
02170	UUO	AK	MATA-SUS BOROUGH	WILLOW	19	0.021
08107	HDN	CO	ROUTT	YAMPA VALLEY	19	0.021
18131	RWN	IN	PULASKI	ARENS FIELD	19	0.021
13105	27A	GA	ELBERT	ELBERT COUNTY-PATZ FIEL	19	0.021
29083	GLY	MO	HENRY	CLINTON MEMORIAL	19	0.021
18103	I76	IN	MIAMI	PERU MUNI	19	0.021
30041	HVR	MT	HILL	HAVRE CITY-COUNTY	19	0.021
37117	MCZ	NC	MARTIN	MARTIN COUNTY	19	0.020
02201	MTM	AK	KETCHIKAN	METLAKATLA	19	0.020
19071	SDA	IA	FREMONT	SHENANDOAH MUNI	18	0.020
29109	2H2	MO	LAWRENCE	AURORA MEMORIAL MUNI	18	0.020
26033	DRM	MI	CHIPPEWA	DRUMMOND ISLAND	18	0.020
21083	M25	KY	GRAVES	MAYFIELD GRAVES COUNTY	18	0.020
48071	T00	TX	CHAMBERS	CHAMBERS COUNTY	18	0.020
51081	EMV	VA	GREENSVILLE	EMPORIA-GREENSVILLE REG	18	0.020
48299	AQO	TX	LLANO	LLANO MUNI	18	0.020
30097	6S0	MT	SWEET GRASS	BIG TIMBER	18	0.020
21177	M21	KY	MUHLENBERG	MUHLENBERG COUNTY	18	0.020
48143	SEP	TX	ERATH	CLARK FIELD MUNI	18	0.020
41023	GCD	OR	GRANT	GRANT CO RGNL/OGILVIE F	18	0.020
06027	L72	CA	INYO	TRONA	18	0.020
06071	SBD	CA	SAN BERNARDINO	SAN BERNARDINO INTERNAT	18	0.020
34035	N52	NC	UNION	JAARS-TOWNSEND	18	0.020
25013	CEF	MA	HAMPDEN	WESTOVER ARB/METROPOLIT	18	0.020
29127	HAE	MO	MARION	HANNIBAL MUNI	18	0.020
29105	LBO	MO	LACLEDE	FLOYD W. JONES LEBANON	18	0.020

55043	73C	WI	GRANT	LANCASTER MUNI	18	0.020
40115	MIO	OK	OTTAWA	MIAMI MUNI	18	0.020
23019	MLT	ME	PENOBSCOT	MILLINOCKET MUNI	18	0.020
26129	Y31	MI	OGEMAW	WEST BRANCH COMMUNITY	18	0.020
29001	IRK	MO	ADAIR	KIRKSVILLE REGIONAL	18	0.020
55001	63C	WI	ADAMS	ADAMS COUNTY LEGION FIE	18	0.020
48061	PIL	TX	CAMERON	PORT ISABEL-CAMERON COU	18	0.020
55083	WI20	WI	OCONTO	LARSON STUDIO	18	0.020
35017	SVC	NM	GRANT	GRANT COUNTY	18	0.019
27091	FRM	MN	MARTIN	FAIRMONT MUNI	18	0.019
46115	1D8	SD	SPINK	REDFIELD MUNI	18	0.019
26019	FKS	MI	BENZIE	FRANKFORT DOW MEMORIAL	18	0.019
40041	3O9	OK	DELAWARE	GRAND LAKE RGNL	18	0.019
53043	68S	WA	LINCOLN	DAVENPORT	18	0.019
46105	6V5	SD	PERKINS	BISON MUNI	18	0.019
53075	72S	WA	WHITMAN	ROSALIA MUNI	18	0.019
02050	ANI	AK	KUSKOKWIM	ANIAK	18	0.019
02050	AQH	AK	BETHEL	QUINHAGAK	18	0.019
13087	BGE	GA	DECATUR	DECATUR COUNTY INDUSTRI	18	0.019
40039	CLK	OK	CUSTER	CLINTON MUNI	18	0.019
17193	CUL	IL	WHITE	CARMI MUNI	18	0.019
15007	HI01	HI	KAUAI	PRINCEVILLE	18	0.019
33007	HIE	NH	COOS	MOUNT WASHINGTON REGION	18	0.019
49025	KNB	UT	KANE	KANAB MUNI	18	0.019
22003	ACP	LA	ALLEN	ALLEN PARISH	18	0.019
27093	LJF	MN	MEEKER	LITCHFIELD MUNI	18	0.019
56027	LSK	WY	NIOBRARA	LUSK MUNI	18	0.019
05061	M77	AR	HOWARD	HOWARD COUNTY	18	0.019
22009	MKV	LA	AVOYELLES	MARKSVILLE MUNICIPAL	18	0.019
17109	MQB	IL	MC DONOUGH	MACOMB MUNI	18	0.019
48279	LIU	TX	LAMB	LITTLEFIELD MUNICIPAL	18	0.019
04001	RQE	AZ	APACHE	WINDOW ROCK	18	0.019
30089	THM	MT	SANDERS	THOMPSON FALLS	18	0.019
27075	TWM	MN	LAKE	RICHARD B HELGESON	18	0.019
51049	FVX	VA	CUMBERLAND	FARMVILLE REGIONAL	18	0.019
39175	56D	OH	WYANDOT	WYANDOT COUNTY	17	0.019
50019	EFK	VT	ORLEANS	NEWPORT STATE	17	0.019
26021	3TR	MI	BERRIEN	JERRY TYLER MEML	17	0.019
28109	M13	MS	PEARL RIVER	POPLARVILLE-PEARL RIVER	17	0.019
02280	PSG	AK	WRANGELL-PETERSBURG	PETERSBURG JAMES A JOHN	17	0.019
30025	BHK	MT	FALLON	BAKER MUNI	17	0.019
19191	DEH	IA	WINNESHIEK	DECORAH MUNI	17	0.019
02164	IGG	AK	BRISTOL BAY	IGIUGIG	17	0.019
48293	LXY	TX	LIMESTONE	MEXIA-LIMESTONE CO	17	0.019
17149	PPQ	IL	PIKE	PITTSFIELD PENSTONE MUN	17	0.019
17107	AAA	IL	LOGAN	LOGAN COUNTY	17	0.019
26043	IMT	MI	DICKINSON	FORD	17	0.019
21075	1M7	KY	FULTON	FULTON	17	0.019

19127	MIW	IA	MARSHALL	MARSHALLTOWN MUNI	17	0.019
19045	CWI	IA	CLINTON	CLINTON MUNI	17	0.019
20151	PTT	KS	PRATT	PRATT INDUSTRIAL	17	0.019
06105	T42	CA	TRINITY	RUTH	17	0.019
05093	BYH	AR	MISSISSIPPI	ARKANSAS INTERNATIONAL	17	0.019
04003	P33	AZ	COCHISE	COCHISE COUNTY	17	0.019
17045	PRG	IL	EDGAR	EDGAR COUNTY	17	0.019
02261	VDZ	AK	VALDEZ-CHITNA-WHITIE	VALDEZ PIONEER FIELD	17	0.019
47041	0A3	TN	DE KALB	SMITHVILLE MUNI	17	0.019
28127	17M	MS	SIMPSON	MAGEE MUNI	17	0.019
13043	MHP	GA	CANDLER	METTER MUNI	17	0.019
51097	FYJ	VA	KING AND QUEEN	MIDDLE PENINSULA RGNL	17	0.019
31027	0B4	NE	CEDAR	HARTINGTON MUNI	17	0.019
55099	PKF	WI	PRICE	PARK FALLS MUNI	17	0.019
48139	F41	TX	ELLIS	ENNIS MUNI	17	0.019
27173	CNB	MN	YELLOW MEDICINE	MYERS FIELD	17	0.019
35007	RTN	NM	COLFAX	RATON MUNICIPAL/CREWS F	17	0.019
13075	15J	GA	COOK	COOK COUNTY	17	0.019
55003	4R5	WI	ASHLAND	MADELINE ISLAND	17	0.019
55017	WI32	WI	CHIPPEWA	T-BO FIELD	17	0.019
17163	BLV	IL	ST CLAIR	SCOTT AFB/MIDAMERICA	17	0.019
19083	IFA	IA	HARDIN	IOWA FALLS MUNI	17	0.018
41041	S45	OR	LINCOLN	SILETZ BAY STATE	17	0.018
51001	TGI	VA	ACCOMACK	TANGIER ISLAND	17	0.018
49013	74V	UT	DUCHESNE	ROOSEVELT MUNI	17	0.018
19179	OTM	IA	WAPELLO	OTTUMWA INDUSTRIAL	17	0.018
19123	OOA	IA	MAHASKA	OSKALOOSA MUNI	17	0.018
29207	DXE	MO	STODDARD	DEXTER MUNI	17	0.018
29091	UNO	MO	HOWELL	WEST PLAINS MUNI	17	0.018
30023	3U3	MT	DEER LODGE	BOWMAN FIELD	17	0.018
48459	JXI	TX	UPSHUR	FOX STEPHENS FIELD - GI	17	0.018
48035	7F7	TX	BOSQUE	CLIFTON MUNICIPAL/ISENH	17	0.018
55057	82C	WI	JUNEAU	MAUSTON-NEW LISBON UNIO	17	0.018
13005	AMG	GA	BACON	BACON COUNTY	17	0.018
48043	E38	TX	BREWSTER	ALPINE-CASPARIS MUNICIP	17	0.018
56035	PNA	WY	SUBLETTE	RALPH WENZ FIELD	17	0.018
18063	2R2	IN	HENDRICKS	HENDRICKS COUNTY-GORDON	17	0.018
08105	MVI	CO	RIO GRANDE	MONTE VISTA MUNI	17	0.018
18011	6I4	IN	BOONE	BOONE COUNTY	16	0.018
08089	LHX	CO	OTERO	LA JUNTA MUNI	16	0.018
54035	I18	WV	JACKSON	JACKSON COUNTY	16	0.018
39065	I95	OH	HARDIN	HARDIN COUNTY	16	0.018
40039	1O4	OK	CUSTER	THOMAS MUNI	16	0.018
45087	35A	SC	UNION	UNION COUNTY, TROY SHEL	16	0.018
13133	3J7	GA	GREENE	GREENE COUNTY REGIONAL	16	0.018
22019	5R8	LA	CALCASIEU	DE QUINCY INDUSTRIAL AI	16	0.018
13295	9A5	GA	WALKER	BARWICK LAFAYETTE	16	0.018
37007	AFP	NC	ANSON	ANSON COUNTY	16	0.018

02261	CDV	AK	CORDOVA-MCCARTHY	MERLE K (MUDHOLE) SMITH	16	0.018
49001	MLF	UT	BEAVER	MILFORD MUNI	16	0.018
08095	HEQ	CO	PHILLIPS	HOLYOKE	16	0.018
31147	FNB	NE	RICHARDSON	BRENNER FIELD	16	0.018
56043	WRL	WY	WASHAKIE	WORLAND MUNI	16	0.018
49041	RIF	UT	SEVIER	RICHFIELD MUNI	16	0.018
48025	BEA	TX	BEE	BEEVILLE MUNI	16	0.018
08087	FMM	CO	MORGAN	FORT MORGAN MUNI	16	0.018
40135	JSV	OK	SEQUOYAH	SALLISAW MUNI	16	0.018
20121	K81	KS	MIAMI	MIAMI COUNTY	16	0.018
29201	SIK	MO	SCOTT	SIKESTON MEML MUNI	16	0.018
29029	H21	MO	CAMDEN	CAMDENTON MEMORIAL	16	0.018
19165	HNR	IA	SHELBY	HARLAN MUNI	16	0.018
19111	EOK	IA	LEE	KEOKUK MUNI	16	0.018
31137	HDE	NE	PHELPS	BREWSTER FIELD	16	0.018
31185	JYR	NE	YORK	YORK MUNICIPAL	16	0.018
31047	LXN	NE	DAWSON	JIM KELLY FIELD	16	0.018
31145	MCK	NE	RED WILLOW	MC COOK MUNI	16	0.018
19125	OXV	IA	MARION	KNOXVILLE MUNI	16	0.018
19021	SLB	IA	BUENA VISTA	STORM LAKE MUNI	16	0.018
27063	MJQ	MN	JACKSON	JACKSON MUNI	16	0.018
02261	GKN	AK	VALDEZ-CHITNA-WHITIE	GULKANA	16	0.017
36089	MSS	NY	ST LAWRENCE	MASSENA INTL-RICHARDS F	16	0.017
28103	20M	MS	NOXUBEE	MACON MUNI	16	0.017
39077	5A1	OH	HURON	NORWALK-HURON COUNTY	16	0.017
47081	GHM	TN	HICKMAN	CENTERVILLE MUNI	16	0.017
45067	MAO	SC	MARION	MARION COUNTY	16	0.017
47017	HZD	TN	CARROLL	CARROLL COUNTY	16	0.017
51195	LNP	VA	WISE	LONESOME PINE	16	0.017
18015	1I9	IN	CARROLL	DELPHI MUNI	16	0.017
12039	2J9	FL	GADSDEN	QUINCY MUNI	16	0.017
47003	SYI	TN	BEDFORD	BOMAR FIELD-SHELBYVILLE	16	0.017
18073	RZL	IN	JASPER	JASPER COUNTY	16	0.017
26075	3NP	MI	JACKSON	NAPOLEON	16	0.017
32001	FLX	NV	CHURCHILL	FALLON MUNI	16	0.017
21095	I35	KY	HARLAN	TUCKER-GUTHRIE MEMORIAL	16	0.017
51001	MFV	VA	ACCOMACK	ACCOMACK COUNTY	16	0.017
40011	O65	OK	BLAINE	CHRISTMAN AIRFIELD	16	0.017
12021	X01	FL	COLLIER	EVERGLADES AIRPARK	16	0.017
72005	BQN	PR		RAFAEL HERNANDEZ	15	0.017
51109	LKU	VA	LOUISA	LOUISA COUNTY/FREEMAN F	15	0.017
47055	GZS	TN	GILES	ABERNATHY FIELD	15	0.017
20125	IDP	KS	MONTGOMERY	INDEPENDENCE MUNI	15	0.017
29157	K02	MO	PERRY	PERRYVILLE MUNI	15	0.017
19125	PEA	IA	MARION	PELLA MUNI	15	0.017
29131	H79	MO	MILLER	ELDON MODEL AIRPARK	15	0.017
20145	LQR	KS	PAWNEE	LARNED-PAWNEE COUNTY	15	0.017
47025	3A2	TN	CLAIBORNE	NEW TAZEWELL MUNICIPAL	15	0.017

36103	1N2	NY	SUFFOLK	SPADARO	15	0.017
26127	C04	MI	OCEANA	OCEANA COUNTY	15	0.017
35006	GNT	NM	CIBOLA	GRANTS-MILAN MUNI	15	0.017
37095	W95	NC	HYDE	OCRACOKE ISLAND	15	0.017
47139	1A3	TN	POLK	MARTIN CAMPBELL FIELD	15	0.017
13161	AZE	GA	JEFF DAVIS	HAZLEHURST	15	0.017
18111	50I	IN	NEWTON	KENTLAND MUNI	15	0.017
26035	48D	MI	CLARE	CLARE MUNI	15	0.017
42085	29D	PA	MERCER	GROVE CITY	15	0.017
40039	OJA	OK	CUSTER	THOMAS P STAFFORD	15	0.017
42129	5G8	PA	WESTMORELAND	GREENSBURG JEANNETTE RE	15	0.017
39151	2D1	OH	STARK	BARBER	15	0.017
06039	2O6	CA	MADERA	CHOWCHILLA	15	0.017
55029	2P2	WI	DOOR	WASHINGTON ISLAND	15	0.017
53033	2S1	WA	KING	VASHON MUNI	15	0.017
06093	36S	CA	SISKIYOU	HAPPY CAMP	15	0.017
54007	48I	WV	BRAXTON	BRAXTON COUNTY	15	0.017
13019	4J2	GA	BERRIEN	BERRIEN CO	15	0.017
23025	59B	ME	SOMERSET	NEWTON FIELD	15	0.017
36063	9G5	NY	NIAGARA	ROYALTON	15	0.017
27111	ADC	MN	OTTER TAIL	WADENA MUNI	15	0.017
36011	B16	NY	CAYUGA	WHITFORDS	15	0.017
17179	C15	IL	TAZEWELL	PEKIN MUNI	15	0.017
48003	E11	TX	ANDREWS	ANDREWS COUNTY	15	0.017
20129	EHA	KS	MORTON	ELKHART-MORTON COUNTY	15	0.017
22119	F24	LA	WEBSTER	MINDEN-WEBSTER	15	0.017
02100	HNS	AK	HAINES	HAINES	15	0.017
40011	JWG	OK	BLAINE	WATONGA	15	0.017
02150	KDK	AK	KODIAK	KODIAK MUNI	15	0.017
48377	MRF	TX	PRESIDIO	MARFA MUNI	15	0.017
17145	PJY	IL	PERRY	PINCKNEYVILLE-DU QUOIN	15	0.017
48225	DKR	TX	HOUSTON	HOUSTON COUNTY	15	0.017
02180	UNK	AK	NOME	UNALAKLEET	15	0.017
55135	WI47	WI	WAUPACA	TIMBERLINE	15	0.017
18057	5I4	IN	HAMILTON	SHERIDAN	15	0.017
02290	ENN	AK	YUKON-KOYUKUK	NENANA MUNI	15	0.017
48133	ETN	TX	EASTLAND	EASTLAND MUNI	15	0.017
04021	P08	AZ	PINAL	COOLIDGE MUNI	15	0.016
45089	CKI	SC	WILLIAMSBURG	WILLIAMSBURG COUNTY	15	0.016
13291	46A	GA	UNION	BLAIRSVILLE	15	0.016
48283	COT	TX	LA SALLE	COTULLA-LA SALLE COUNTY	15	0.016
20141	K75	KS	OSBORNE	OSBORNE MUNI	15	0.016
27149	MOX	MN	STEVENS	MORRIS MUNI	15	0.016
29007	MYJ	MO	AUDRAIN	MEXICO MEMORIAL	15	0.016
19027	CIN	IA	CARROLL	ARTHUR N NEU	15	0.016
31099	0V3	NE	KEARNEY	PIONEER VILLAGE FIELD	15	0.016
51185	6V3	VA	TAZEWELL	TAZEWELL COUNTY	15	0.016
31081	AUH	NE	HAMILTON	AURORA MUNICIPAL	15	0.016

31067	BIE	NE	GAGE	BEATRICE MUNICIPAL	15	0.016
20015	EQA	KS	BUTLER	CAPTAIN JACK THOMAS/EL	15	0.016
20031	UKL	KS	COFFEY	COFFEY COUNTY	15	0.016
23021	3B1	ME	PISCATAQUIS	GREENVILLE MUNI	15	0.016
46049	3FU	SD	FAULK	FAULKTON MUNI	15	0.016
20099	PPF	KS	LABETTE	TRI-CITY	15	0.016
53027	W04	WA	GRAYS HARBOR	OCEAN SHORES MUNI	15	0.016
36111	N89	NY	ULSTER	JOSEPH Y RESNICK	15	0.016
39079	I43	OH	JACKSON	JAMES A RHODES	15	0.016
37187	PMZ	NC	WASHINGTON	PLYMOUTH MUNI	15	0.016
33019	2B3	NH	SULLIVAN	PARLIN FIELD	14	0.016
27153	14Y	MN	TODD	TODD FIELD	14	0.016
26151	77G	MI	SANILAC	MARLETTE	14	0.016
28135	09M	MS	TALLAHATCHIE	CHARLESTON MUNI	14	0.016
30035	CTB	MT	GLACIER	CUT BANK MUNI	14	0.016
48147	F00	TX	FANNIN	JONES FIELD	14	0.016
48159	F53	TX	FRANKLIN	FRANKLIN COUNTY	14	0.016
45031	HVS	SC	DARLINGTON	HARTSVILLE RGNL	14	0.016
48267	JCT	TX	KIMBLE	KIMBLE COUNTY	14	0.016
13227	JZP	GA	PICKENS	PICKENS COUNTY	14	0.016
23019	LRG	ME	PENOBSCOT	LINCOLN REGIONAL	14	0.016
36089	PTD	NY	ST LAWRENCE	POTSDAM MUNI/DAMON FLD/	14	0.016
28013	04M	MS	CALHOUN	CALHOUN COUNTY	14	0.016
20181	GLD	KS	SHERMAN	RENNER FLD /GOODLAND MU	14	0.016
18091	MGC	IN	LA PORTE	MICHIGAN CITY MUNI	14	0.016
19067	CCY	IA	FLOYD	CHARLES CITY MUNI	14	0.016
19063	EST	IA	EMMET	ESTHERVILLE MUNI	14	0.016
19073	EFW	IA	GREENE	JEFFERSON MUNI	14	0.016
20189	HQG	KS	STEVENS	HUGOTON MUNI	14	0.016
19019	IIB	IA	BUCHANAN	INDEPENDENCE MUNI	14	0.016
19145	ICL	IA	PAGE	SCHENCK FIELD	14	0.016
48325	23R	TX	MEDINA	DEVINE MUNI	14	0.016
18135	I22	IN	RANDOLPH	RANDOLPH COUNTY	14	0.015
48337	0F2	TX	MONTAGUE	BOWIE MUNI	14	0.015
13253	17J	GA	SEMINOLE	DONALSONVILLE MUNI	14	0.015
13119	18A	GA	FRANKLIN	FRANKLIN COUNTY	14	0.015
53001	33S	WA	ADAMS	PRU FIELD	14	0.015
13193	53A	GA	MACON	DR. C P SAVAGE SR.	14	0.015
45035	6J2	SC	DORCHESTER	ST GEORGE	14	0.015
20125	CFV	KS	MONTGOMERY	COFFEYVILLE MUNI	14	0.015
49027	DTA	UT	MILLARD	DELTA MUNI	14	0.015
48079	F85	TX	COCHRAN	COCHRAN COUNTY	14	0.015
32007	LWL	NV	ELKO	WELLS MUNICIPAL/HARRIET	14	0.015
06045	O28	CA	MENDOCINO	ELLS FIELD-WILLITS MUNI	14	0.015
28061	00M	MS	JASPER	THIGPEN FIELD	14	0.015
31003	4V9	NE	ANTELOPE	ANTELOPE COUNTY	14	0.015
47049	2A1	TN	FENTRESS	JAMESTOWN MUNI	14	0.015
56009	DGW	WY	CONVERSE	CONVERSE COUNTY	14	0.015

30015	79S	MT	CHOUTEAU	FORT BENTON	14	0.015
05093	7M4	AR	MISSISSIPPI	OSCEOLA MUNI	14	0.015
29013	BUM	MO	BATES	BUTLER MEMORIAL	14	0.015
20061	3JC	KS	GEARY	FREEMAN FIELD	14	0.015
48373	00R	TX	POLK	LIVINGSTON MUNI	14	0.015
48093	MKN	TX	COMANCHE	COMANCHE COUNTY-CITY	14	0.015
46053	9D1	SD	GREGORY	GREGORY MUNI	14	0.015
01107	AIV	AL	PICKENS	GEORGE DOWNER	14	0.015
48241	JAS	TX	JASPER	JASPER COUNTY-BELL FIEL	14	0.015
21025	JKL	KY	BREATHITT	JULIAN CARROLL	14	0.015
48395	LHB	TX	ROBERTSON	HEARNE MUNI	14	0.015
19029	AIO	IA	CASS	ATLANTIC MUNI	14	0.015
19099	TNU	IA	JASPER	NEWTON MUNI	14	0.015
32007	06U	NV	ELKO	JACKPOT/HAYDEN FIELD	14	0.015
29117	CHT	MO	LIVINGSTON	CHILLICOTHE MUNI	14	0.015
19117	CNC	IA	LUCAS	CHARITON MUNI	14	0.015
19011	VTI	IA	BENTON	VINTON VETERANS MEML AR	14	0.015
08075	STK	CO	LOGAN	STERLING MUNI	14	0.015
30015	3U8	MT	CHOUTEAU	BIG SANDY	13	0.015
30075	BDX	MT	POWDER RIVER	BROADUS	13	0.015
18017	GGP	IN	CASS	LOGANSPORT MUNI	13	0.015
19121	3Y3	IA	MADISON	WINTERSET-MADISON COUNT	13	0.015
06031	CRO	CA	KINGS	CORCORAN	13	0.015
04017	06AZ	AZ	NAVAJO	POLACCA	13	0.015
41015	4S1	OR	CURRY	GOLD BEACH MUNI	13	0.015
46109	8D3	SD	ROBERTS	SISSETON MUNI	13	0.015
40119	CUH	OK	PAYNE	CUSHING MUNI	13	0.015
06047	MER	CA	MERCED	CASTLE	13	0.015
02164	PNP	AK	ALEUTIAN ISLANDS	PILOT POINT	13	0.015
30059	7S6	MT	MEAGHER	WHITE SULPHUR SPRINGS	13	0.015
27165	JYG	MN	WATONWAN	ST JAMES MUNI	13	0.015
72069	X63	PR		HUMACAO	13	0.015
48021	84R	TX	BASTROP	SMITHVILLE CRAWFORD MUN	13	0.015
21229	6I2	KY	WASHINGTON	LEBANON-SPRINGFIELD	13	0.014
39139	GQQ	OH	RICHLAND	GALION MUNI	13	0.014
13317	IIY	GA	WILKES	WASHINGTON-WILKES COUNT	13	0.014
21207	K24	KY	RUSSELL	RUSSELL COUNTY	13	0.014
48013	PEZ	TX	ATASCOSA	PLEASANTON MUNI	13	0.014
01091	7A2	AL	MARENGO	DEMOPOLIS MUNI	13	0.014
39055	7G8	OH	GEAUGA	GEAUGA COUNTY	13	0.014
20159	LYO	KS	RICE	LYONS-RICE COUNTY MUNI	13	0.014
20039	OIN	KS	DECATUR	OBERLIN MUNI	13	0.014
20035	WLD	KS	COWLEY	STROTHER FIELD	13	0.014
27021	XVG	MN	CASS	LONGVILLE MUNI	13	0.014
31179	LCG	NE	WAYNE	WAYNE MUNI	13	0.014
29217	NVD	MO	VERNON	NEVADA MUNI	13	0.014
19151	POH	IA	POCAHONTAS	POCAHONTAS MUNI	13	0.014
01031	14J	AL	COFFEE	CARL FOLSOM	13	0.014

36027	46N	NY	DUTCHESS	SKY PARK	13	0.014
53073	4W6	WA	WHATCOM	BLAINE MUNI	13	0.014
39001	AMT	OH	ADAMS	ALEXANDER SALAMON	13	0.014
27151	BBB	MN	SWIFT	BENSON MUNI	13	0.014
48047	BKS	TX	BROOKS	BROOKS COUNTY	13	0.014
28059	M50	OR	MORROW	BOARDMAN	13	0.014
21205	I32	KY	ROWAN	MOREHEAD-ROWAN COUNTY	13	0.014
32003	U08	NV	CLARK	PERKINS FIELD	13	0.014
29123	H88	MO	MADISON	FREDERICKTOWN REGIONAL	13	0.014
56045	ECS	WY	WESTON	MONDELL FIELD	13	0.014
05043	LLQ	AR	DREW	MONTICELLO MUNI/ELLIS F	13	0.014
49021	1L9	UT	IRON	PAROWAN	13	0.014
19111	FSW	IA	LEE	FORT MADISON MUNI	13	0.014
30085	42S	MT	ROOSEVELT	POPLAR	13	0.014
48341	DUX	TX	MOORE	MOORE COUNTY	13	0.014
46019	EFC	SD	BUTTE	BELLE FOURCHE MUNICIPAL	13	0.014
20137	NRN	KS	NORTON	NORTON MUNI	13	0.014
39015	GEO	OH	BROWN	BROWN COUNTY	13	0.014
02170	Z40	AK	ANCHORAGE	GOOSE BAY	13	0.014
36067	1G6	NY	ONONDAGA	MICHAEL AIRFIELD	13	0.014
48193	MNZ	TX	HAMILTON	HAMILTON MUNI	13	0.014
12089	01J	FL	NASSAU	HILLIARD AIRPARK	13	0.014
46107	0D8	SD	POTTER	GETTYSBURG MUNI	13	0.014
20075	3K3	KS	HAMILTON	SYRACUSE-HAMILTON COUNT	13	0.014
20203	3K7	KS	WICHITA	MARK HOARD MEML	13	0.014
06047	3O1	CA	MERCED	GUSTINE	13	0.014
22085	3R4	LA	SABINE	HART	13	0.014
05065	42A	AR	IZARD	MELBOURNE MUNI - JOHN E	13	0.014
13199	5A9	GA	MERIWETHER	ROOSEVELT MEMORIAL	13	0.014
37011	7A8	NC	AVERY	AVERY COUNTY/MORRISON F	13	0.014
46083	7G9	SD	LINCOLN	CANTON MUNI	13	0.014
05047	7M5	AR	FRANKLIN	OZARK-FRANKLIN COUNTY	13	0.014
02220	A29	AK	SITKA	SITKA	13	0.014
23007	B21	ME	FRANKLIN	SUGARLOAF REGIONAL	13	0.014
17187	C66	IL	WARREN	MONMOUTH MUNI	13	0.014
40009	ELK	OK	BECKHAM	ELK CITY MUNI	13	0.014
46047	HSR	SD	FALL RIVER	HOT SPRINGS MUNI	13	0.014
13305	JES	GA	WAYNE	JESUP-WAYNE COUNTY	13	0.014
06071	L26	CA	SAN BERNARDINO	HESPERIA	13	0.014
06073	L39	LA	VERNON	LEESVILLE	13	0.014
20119	MEJ	KS	MEADE	MEADE MUNI	13	0.014
13309	MQW	GA	WHEELER	TELFAIR-WHEELER	13	0.014
36071	N72	NY	ORANGE	WARWICK MUNI	13	0.014
30053	S59	MT	LINCOLN	LIBBY	13	0.014
22119	SPH	LA	WEBSTER	SPRINGHILL	13	0.014
27039	TOB	MN	DODGE	DODGE CENTER	13	0.014
27011	VVV	MN	BIG STONE	ORTONVILLE MUNI-MARTINS	13	0.014
12069	X23	FL	LAKE	UMATILLA MUNI	13	0.014

47051	BGF	TN	FRANKLIN	WINCHESTER MUNI	12	0.014
19081	FXY	IA	HANCOCK	FOREST CITY MUNI	12	0.014
19141	SHL	IA	O BRIEN	SHELDON MUNI	12	0.014
55069	TKV	WI	LINCOLN	TOMAHAWK REGIONAL	12	0.014
20095	9K8	KS	KINGMAN	KINGMAN AIRPORT - CLYDE	12	0.014
19017	C25	IA	BREMER	WAVERLY MUNI	12	0.014
51093	FKN	VA	ISLE OF WIGHT	FRANKLIN MUNI-JOHN BEVE	12	0.014
18117	FRH	IN	ORANGE	FRENCH LICK MUNI	12	0.014
38099	GAF	ND	WALSH	GRAFTON MUNI	12	0.014
27121	GHW	MN	POPE	GLENWOOD MUNI	12	0.014
19149	LRJ	IA	PLYMOUTH	LE MARS MUNI	12	0.014
29215	M48	MO	TEXAS	HOUSTON MEMORIAL	12	0.014
06045	D83	CA	MENDOCINO	BOONVILLE	12	0.014
19161	SKI	IA	SAC	SAC CITY MUNI	12	0.014
41037	LKV	OR	LAKE	LAKE COUNTY	12	0.013
02231	HNH	AK	JUNEAU	HOONAH	12	0.013
31097	0G3	NE	JOHNSON	TECUMSEH MUNICIPAL	12	0.013
39163	22I	OH	VINTON	VINTON COUNTY	12	0.013
04017	E24	AZ	NAVAJO	WHITERIVER	12	0.013
23003	PQI	ME	AROOSTOOK	NORTHERN MAINE REGIONAL	12	0.013
41063	4S3	OR	WALLOWA	JOSEPH STATE	12	0.013
21197	I50	KY	POWELL	STANTON	12	0.013
28153	2R0	MS	WAYNE	WAYNESBORO MUNI	12	0.013
55021	C47	WI	COLUMBIA	PORTAGE MUNI	12	0.013
37065	ETC	NC	EDGECOMBE	TARBORO-EDGECOMBE	12	0.013
48213	F44	TX	HENDERSON	ATHENS MUNI	12	0.013
22109	L83	LA	TERREBONNE	THIBODAUX MUNICIPAL	12	0.013
04017	TYL	AZ	NAVAJO	TAYLOR	12	0.013
49037	U43	UT	SAN JUAN	MONTICELLO	12	0.013
41025	BNO	OR	HARNEY	BURNS MUNI	12	0.013
29069	MAW	MO	DUNKLIN	MALDEN MUNI	12	0.013
51031	0V4	VA	CAMPBELL	BROOKNEAL/CAMPBELL COUN	12	0.013
30051	LTY	MT	LIBERTY	LIBERTY COUNTY	12	0.013
51017	HSP	VA	BATH	INGALLS FIELD	12	0.013
47013	JAU	TN	CAMPBELL	CAMPBELL COUNTY	12	0.013
21191	K62	KY	PENDLETON	GENE SNYDER	12	0.013
06049	O59	CA	MODOC	CEDARVILLE	12	0.013
30065	RPX	MT	MUSSELSHELL	ROUNDUP	12	0.013
48057	PKV	TX	CALHOUN	CALHOUN COUNTY	12	0.013
26151	Y83	MI	SANILAC	SANDUSKY CITY	12	0.013
41039	6S2	OR	LANE	FLORENCE MUNI	12	0.013
20133	CNU	KS	NEOSHO	CHANUTE MARTIN JOHNSON	12	0.013
29009	M58	MO	BARRY	MONETT MUNI	12	0.013
31021	TQE	NE	BURT	TEKAMAH MUNI	12	0.013
04017	0V7	AZ	NAVAJO	KAYENTA	12	0.013
28079	08M	MS	LEAKE	CARTHAGE-LEAKE COUNTY	12	0.013
02280	AFE	AK	WRANGELL-PETERSBURG	KAKE	12	0.013
04017	P14	AZ	NAVAJO	HOLBROOK MUNI	12	0.013

53055	W33	WA	SAN JUAN	FRIDAY HARBOR	12	0.013
30085	S85	MT	ROOSEVELT	BIG SKY FIELD	11	0.013
05041	0M0	AR	DESHA	BILLY FREE MUNICIPAL	11	0.012
54059	4I0	WV	MINGO	MINGO COUNTY	11	0.012
48217	INJ	TX	HILL	HILLSBORO MUNI	11	0.012
13287	75J	GA	TURNER	TURNER COUNTY	11	0.012
46069	9D0	SD	HYDE	HIGHMORE MUNI	11	0.012
46007	9V6	SD	BENNETT	MARTIN MUNI	11	0.012
02185	BRW	AK	NORTH SLOPE	WILEY POST-WILL ROGERS	11	0.012
48215	EBG	TX	HIDALGO	Edinburg Rio Grande Val	11	0.012
08073	LIC	CO	LINCOLN	LIMON MUNI	11	0.012
30087	M46	MT	ROSEBUD	COLSTRIP	11	0.012
23029	PNN	ME	WASHINGTON	PRINCETON MUNI	11	0.012
48391	RFG	TX	REFUGIO	ROOKE FIELD	11	0.012
48353	SWW	TX	NOLAN	AVENGER FIELD	11	0.012
49023	U14	UT	JUAB	NEPHI MUNI	11	0.012
30019	9S2	MT	DANIELS	SCOBEY	11	0.012
47069	M08	TN	HARDEMAN	WILLIAM L. WHITEHURST F	11	0.012
24033	ADW	MD	PRINCE GEORGES	ANDREWS AFB	11	0.012
20011	FSK	KS	BOURBON	FORT SCOTT MUNI	11	0.012
20139	53K	KS	OSAGE	OSAGE CITY MUNI	11	0.012
19109	AXA	IA	KOSSUTH	ALGONA MUNI	11	0.012
04013	E63	AZ	MARICOPA	GILA BEND MUNI	11	0.012
19001	GFZ	IA	ADAIR	GREENFIELD MUNI	11	0.012
39127	I86	OH	PERRY	PERRY COUNTY	11	0.012
19105	MXO	IA	JONES	MONTICELLO REGIONAL	11	0.012
19049	PRO	IA	DALLAS	PERRY MUNI	11	0.012
51111	W31	VA	LUNENBURG	LUNENBURG COUNTY	11	0.012
21033	2M0	KY	CALDWELL	PRINCETON-CALDWELL COUN	11	0.012
46075	8F6	SD	JONES	MURDO MUNI	11	0.012
45009	99N	SC	BAMBERG	BAMBERG COUNTY	11	0.012
56041	FBR	WY	UINTA	FORT BRIDGER	11	0.012
28065	M43	MS	JEFFERSON DAVIS	PRENTISS-JEFFERSON DAVI	11	0.012
27021	PWC	MN	CASS	PINE RIVER REGIONAL	11	0.012
55041	Y55	WI	FOREST	CRANDON MUNI	11	0.012
51027	GDY	VA	BUCHANAN	GRUNDY MUNI	11	0.012
08125	2V6	CO	YUMA	YUMA MUNI	11	0.012
31053	SCB	NE	DODGE	SCRIBNER STATE	11	0.012
30021	GDV	MT	DAWSON	DAWSON COMMUNITY	11	0.012
05135	CVK	AR	SHARP	SHARP COUNTY REGIONAL	11	0.012
46009	Y03	SD	BON HOMME	SPRINGFIELD MUNI	11	0.012
41051	61J	OR	MULTNOMAH	PORTLAND DOWNTOWN	11	0.012
46023	1D3	SD	CHARLES MIX	PLATTE MUNI	11	0.012
20013	K83	KS	BROWN	SABETHA MUNI	11	0.012
48099	GOP	TX	CORYELL	CITY-COUNTY	11	0.012
46103	6V4	SD	PENNINGTON	WALL MUNI	11	0.012
46067	8V3	SD	HUTCHINSON	PARKSTON MUNI	11	0.012
55081	CMY	WI	MONROE	SPARTA/FORT MC COY	11	0.012

48475	E01	TX	WARD	ROY HURD MEMORIAL	11	0.012
35025	E26	NM	LEA	LEA COUNTY/JAL/	11	0.012
48089	ELA	TX	COLORADO	EAGLE LAKE	11	0.012
30045	S64	MT	JUDITH BASIN	STANFORD	11	0.012
48071	T90	TX	CHAMBERS	CHAMBERS COUNTY-WINNIE	11	0.012
20073	13K	KS	GREENWOOD	EUREKA MUNI	10	0.012
19047	DNS	IA	CRAWFORD	DENISON MUNI	10	0.012
19079	EBS	IA	HAMILTON	WEBSTER CITY MUNI	10	0.012
20167	RSL	KS	RUSSELL	RUSSELL MUNI	10	0.012
29147	EVU	MO	NODAWAY	MARYVILLE MEML	10	0.012
31105	IBM	NE	KIMBALL	KIMBALL MUNI/ROBERT E A	10	0.012
31029	IML	NE	CHASE	IMPERIAL MUNI	10	0.012
40093	6K4	OK	MAJOR	FAIRVIEW MUNI	10	0.011
40079	RKR	OK	LE FLORE	ROBERT S KERR	10	0.011
27045	FKA	MN	FILLMORE	FILLMORE COUNTY	10	0.011
31131	AFK	NE	OTOE	NEBRASKA CITY MUNICIPAL	10	0.011
27083	TKC	MN	LYON	TRACY MUNI	10	0.011
31121	07K	NE	MERRICK	CENTRAL CITY MUNI	10	0.011
38017	K74	ND	CASS	HAMRY FIELD	10	0.011
13099	BIJ	GA	EARLY	EARLY COUNTY	10	0.011
37099	24A	NC	JACKSON	JACKSON COUNTY	10	0.011
13179	2J2	GA	LIBERTY	LIBERTY COUNTY	10	0.011
20093	36K	KS	KEARNY	LAKIN	10	0.011
20135	48K	KS	NESS	NESS CITY MUNI	10	0.011
48113	49T	TX	DALLAS	DALLAS CBD VERTIPORT	10	0.011
36093	4B1	NY	SCHENECTADY	DUANESBURG	10	0.011
55025	58C	WI	DANE	JANA	10	0.011
31171	TIF	NE	THOMAS	THOMAS COUNTY	10	0.011
05097	7M3	AR	MONTGOMERY	BEARCE	10	0.011
23009	93B	ME	HANCOCK	STONINGTON MUNI	10	0.011
46091	BTN	SD	MARSHALL	BRITTON MUNI	10	0.011
17131	C00	IL	MERCER	MERCER COUNTY	10	0.011
35059	CAO	NM	UNION	CLAYTON MUNI ARPK	10	0.011
12075	CDK	FL	LEVY	GEORGE T LEWIS	10	0.011
40095	F31	OK	MARSHALL	LAKE TEXOMA STATE PARK	10	0.011
27027	JKJ	MN	CLAY	MOORHEAD MUNI	10	0.011
40057	O35	OK	HARMON	HOLLIS MUNI	10	0.011
56029	POY	WY	PARK	POWELL MUNI	10	0.011
13267	RVJ	GA	TATTNALL	REIDSVILLE	10	0.011
53007	S10	WA	CHELAN	CHELAN MUNI	10	0.011
13107	SBO	GA	EMANUEL	EMANUEL COUNTY	10	0.011
17015	SFY	IL	CARROLL	TRI-TOWNSHIP	10	0.011
48281	LZZ	TX	LAMPASAS	LAMPASAS	10	0.011
29199	03D	MO	SCOTLAND	MEMPHIS MEMORIAL	10	0.011
20023	SYF	KS	CHEYENNE	CHEYENNE COUNTY MUNI	10	0.011
02290	FLT	AK	KUSKOKWIM	FLAT	10	0.011
29159	DMO	MO	PETTIS	SEDALIA MEMORIAL	10	0.011
19039	I75	IA	CLARKE	OSCEOLA MUNICIPAL	10	0.011

18111	C98	IN	NEWTON	LAKE VILLAGE	10	0.011
20123	K61	KS	MITCHELL	MORITZ MEMORIAL	10	0.011
20001	K88	KS	ALLEN	ALLEN COUNTY	10	0.011
31059	FMZ	NE	FILLMORE	FAIRMONT STATE AIRFIELD	10	0.011
31135	GGF	NE	PERKINS	GRANT MUNI	10	0.011
19069	HPT	IA	FRANKLIN	HAMPTON MUNI	10	0.011
29011	LLU	MO	BARTON	LAMAR MUNI	10	0.011
19065	OLZ	IA	FAYETTE	OELWEIN MUNI	10	0.011
19137	RDK	IA	MONTGOMERY	RED OAK MUNI	10	0.011
16041	U10	ID	FRANKLIN	PRESTON	10	0.011
27155	ETH	MN	TRAVERSE	WHEATON MUNI	10	0.011
21159	K22	KY	MARTIN	BIG SANDY REGIONAL	10	0.011
30089	S34	MT	SANDERS	PLAINS	10	0.011
01053	0R1	AL	ESCAMBIA	ATMORE MUNI	10	0.011
30005	48S	MT	BLAINE	HARLEM	10	0.011
21183	7K4	KY	OHIO	OHIO COUNTY	10	0.011
15009	LNY	HI	MAUI	LANAI	10	0.011
08049	20V	CO	GRAND	MC ELROY AIRFIELD	10	0.011
31159	SWT	NE	SEWARD	SEWARD MUNICIPAL	10	0.011
48199	45R	TX	HARDIN	HAWTHORNE FIELD	10	0.011
30015	5U8	MT	CHOUTEAU	GERALDINE	10	0.011
42049	8G2	PA	ERIE	CORRY-LAWRENCE	10	0.011
30005	9U0	MT	BLAINE	TURNER	10	0.011
13109	CWV	GA	EVANS	CLAXTON-EVANS COUNTY	10	0.011
48359	E52	TX	OLDHAM	OLDHAM COUNTY	10	0.011
02070	CLP	AK	BRISTOL BAY	CLARKS POINT	10	0.010
30085	OLF	MT	ROOSEVELT	L M CLAYTON	9	0.010
01013	PRN	AL	BUTLER	MAC CRENSHAW MEMORIAL	9	0.010
45069	BBP	SC	MARLBORO	MARLBORO COUNTY JETPORT	9	0.010
30055	4U6	MT	MC CONE	CIRCLE TOWN COUNTY	9	0.010
30073	S01	MT	PONDERA	CONRAD	9	0.010
56031	EAN	WY	PLATTE	PHIFER AIRFIELD	9	0.010
18165	1I7	IN	VERMILLION	CLINTON	9	0.010
27137	12D	MN	ST LOUIS	TOWER MUNI	9	0.010
35025	E06	NM	LEA	LEA COUNTY-ZIP FRANKLIN	9	0.010
38081	GWR	ND	SARGENT	GWINNER-ROGER MELROE FI	9	0.010
30049	S69	MT	LEWIS AND CLARK	LINCOLN	9	0.010
29065	K33	MO	DENT	SALEM MEMORIAL	9	0.010
29175	MBY	MO	RANDOLPH	OMAR N BRADLEY	9	0.010
20157	RPB	KS	REPUBLIC	BELLEVILLE MUNI	9	0.010
31011	BVN	NE	BOONE	ALBION MUNI	9	0.010
19087	MPZ	IA	HENRY	MOUNT PLEASANT MUNI	9	0.010
31031	VTN	NE	CHERRY	MILLER FIELD	9	0.010
01097	4R9	AL	MOBILE	DAUPHIN ISLAND	9	0.010
06025	L04	CA	IMPERIAL	HOLTVILLE	9	0.010
27031	CKC	MN	COOK	GRAND MARAIS/COOK COUNT	9	0.010
26069	6D9	MI	IOSCO	IOSCO COUNTY	9	0.010
46063	9D2	SD	HARDING	HARDING COUNTY	9	0.010

48127	CZT	TX	DIMMIT	DIMMIT COUNTY	9	0.010
37095	7W6	NC	HYDE	HYDE COUNTY	9	0.010
38095	9D7	ND	TOWNER	CANDO MUNI	9	0.010
47115	APT	TN	MARION	MARION COUNTY-BROWN FIE	9	0.010
26095	ERY	MI	LUCE	LUCE COUNTY	9	0.010
01007	0A8	AL	BIBB	BIBB COUNTY	9	0.010
31065	CSB	NE	FURNAS	CAMBRIDGE MUNI	9	0.010
04005	P32	AZ	COCONINO	H.A. CLARK MEMORIAL FIE	9	0.010
01019	C22	AL	CHEROKEE	CENTRE MUNI	9	0.010
46051	1D1	SD	GRANT	MILBANK MUNI	9	0.010
22017	3F4	LA	CADDO	VIVIAN	9	0.010
22001	3R2	LA	ACADIA	LE GROS MEMORIAL	9	0.010
08055	4V1	CO	HUERFANO	SPANISH PEAKS AIRFIELD	9	0.010
20069	8K8	KS	GRAY	CIMARRON MUNI	9	0.010
02164	AJC	AK	ALEUTIAN ISLANDS	CHIGNIK	9	0.010
02188	BVK	AK	UNORGANIZED	BUCKLAND	9	0.010
27055	CHU	MN	HOUSTON	HOUSTON COUNTY	9	0.010
29047	GPH	MO	CLAY	CLAY COUNTY REGIONAL	9	0.010
40023	HHW	OK	CHOCTAW	STAN STAMPER MUNI	9	0.010
02270	KSM	AK	WADE HAMPTON	ST MARY'S	9	0.010
36075	N00	NY	GREENE	MABEN	9	0.010
47051	UOS	TN	FRANKLIN	FRANKLIN COUNTY	9	0.010
27079	12Y	MN	LE SUEUR	LE SUEUR MUNI	9	0.010
56003	GEY	WY	BIG HORN	SOUTH BIG HORN COUNTY	9	0.010
01107	3M8	AL	PICKENS	NORTH PICKENS	9	0.010
38097	3H4	ND	TRAILL	HILLSBORO MUNI	9	0.010
20193	CBK	KS	THOMAS	SHALZ FIELD	9	0.010
20029	CNK	KS	CLOUD	BLOSSER MUNI	9	0.010
20027	CYW	KS	CLAY	CLAY CENTER MUNI	9	0.009
19147	EGQ	IA	PALO ALTO	EMMETSBURG MUNI	9	0.009
40063	F99	OK	HUGHES	HOLDENVILLE MUNI	9	0.009
29121	K89	MO	MACON	MACON-FOWER MEML	9	0.009
06029	L84	CA	KERN	LOST HILLS-KERN COUNTY	9	0.009
29069	TKX	MO	DUNKLIN	KENNETT MEMORIAL	9	0.009
26027	C91	MI	CASS	DOWAGIAC MUNICIPAL	9	0.009
29079	TRX	MO	GRUNDY	TRENTON MUNI	9	0.009
30077	38S	MT	POWELL	DEER LODGE-CITY-COUNTY	9	0.009
45051	5J9	SC	HORRY	TWIN CITY	9	0.009
56035	BPI	WY	SUBLETTE	BIG PINEY-MARBLETON	9	0.009
35023	LSB	NM	HIDALGO	LORDSBURG MUNI	9	0.009
30067	LVM	MT	PARK	MISSION FIELD	9	0.009
05121	M70	AR	RANDOLPH	NICK WILSON FIELD	9	0.009
28007	OSX	MS	ATTALA	KOSCIUSKO-ATTALA COUNTY	9	0.009
18097	8A4	IN	MARION	INDIANAPOLIS DOWNTOWN	9	0.009
02170	SKW	AK	MATA-SUS BOROUGH	SKWENTNA	8	0.009
26005	41C	MI	ALLEGAN	CALKINS FIELD	8	0.009
26123	42C	MI	NEWAYGO	WHITE CLOUD	8	0.009
29163	H19	MO	PIKE	BOWLING GREEN MUNI	8	0.009

38009	D09	ND	BOTTINEAU	BOTTINEAU MUNI	8	0.009
37123	43A	NC	MONTGOMERY	MONTGOMERY COUNTY	8	0.009
48387	LBR	TX	RED RIVER	CLARKSVILLE-RED RIVER C	8	0.009
02020	AQY	AK	ANCHORAGE	GIRDWOOD	8	0.009
27075	BFW	MN	LAKE	SILVER BAY MUNI	8	0.009
48495	INK	TX	WINKLER	WINKLER COUNTY	8	0.009
20165	K94	KS	RUSH	RUSH COUNTY	8	0.009
40153	MDF	OK	WOODWARD	MOORELAND MUNI	8	0.009
01017	7A3	AL	CHAMBERS	CHAMBERS MUNI	8	0.009
15005	LUP	HI	KALAWAO	KALAUPAPA	8	0.009
13211	52A	GA	MORGAN	MADISON MUNI	8	0.009
30007	8U8	MT	BROADWATER	TOWNSEND	8	0.009
36053	H30	NY	MADISON	HAMILTON MUNICIPAL	8	0.009
49015	U34	UT	EMERY	GREEN RIVER MUNI	8	0.009
01131	61A	AL	WILCOX	CAMDEN MUNI	8	0.009
22105	0R9	KS	ROOKS	PLAINVILLE ARPK	8	0.009
40025	17K	OK	CIMARRON	BOISE CITY	8	0.009
40095	1F4	OK	MARSHALL	MADILL MUNI	8	0.009
02180	2C7	AK	NOME	SHAKTOOLIK	8	0.009
51117	CXE	VA	MECKLENBURG	CHASE CITY MUNI	8	0.009
38099	Y37	ND	WALSH	PARK RIVER - W C SKJERV	8	0.009
02290	CEM	AK	UPPER YUKON	CENTRAL	8	0.009
29091	MNF	MO	HOWELL	MOUNTAIN VIEW	8	0.009
19183	AWG	IA	WASHINGTON	WASHINGTON MUNI	8	0.009
48247	HBV	TX	JIM HOGG	JIM HOGG COUNTY	8	0.009
40127	80F	OK	PUSHMATAHA	ANTLERS MUNI	8	0.009
54053	3I2	WV	MASON	MASON COUNTY	8	0.009
06045	LLR	CA	MENDOCINO	LITTLE RIVER	8	0.009
26091	MI51	MI	LENAWEE	LOARS FIELD INC	8	0.009
06051	O57	CA	MONO	BRYANT FIELD	8	0.009
09009	N04	CT	NEW HAVEN	GRISWOLD	8	0.009
26029	SJX	MI	CHARLEVOIX	BEAVER ISLAND	8	0.009
01111	7A5	AL	RANDOLPH	ROANOKE MUNI	8	0.009
46119	98D	SD	SULLY	ONIDA MUNI	8	0.009
02290	ARC	AK	UPPER YUKON	ARCTIC VILLAGE	8	0.009
29009	94K	MO	BARRY	CASSVILLE MUNI	8	0.009
36041	K09	NY	HAMILTON	PISECO	8	0.008
40141	1O1	OK	TILLMAN	GRANDFIELD MUNI	8	0.008
33009	1P1	NH	GRAFTON	PLYMOUTH MUNI	8	0.008
22059	1R1	LA	LA SALLE	JENA	8	0.008
06027	2O7	CA	INYO	INDEPENDENCE	8	0.008
05011	3M9	AR	BRADLEY	WARREN MUNI	8	0.008
48169	5F1	TX	GARZA	POST-GARZA COUNTY MUNI	8	0.008
13033	BXG	GA	BURKE	BURKE COUNTY	8	0.008
05003	CRT	AR	ASHLEY	Z M JACK STELL FIELD	8	0.008
55125	D25	WI	VILAS	MANITOWISH WATERS	8	0.008
48087	F06	TX	COLLINGSWORTH	MARIAN AIRPARK	8	0.008
48499	F51	TX	WOOD	WINNSBORO MUNI	8	0.008

17009	I63	IL	BROWN	MOUNT STERLING MUNICIPA	8	0.008
39027	ILN	OH	CLINTON	AIRBORNE AIRPARK	8	0.008
17017	K06	IL	CASS	GREATER BEARDSTOWN	8	0.008
13321	SYV	GA	WORTH	SYLVESTER	8	0.008
08011	7V9	CO	BENT	CITY AND COUNTY	8	0.008
30047	7S0	MT	LAKE	RONAN	7	0.008
38105	D60	ND	WILLIAMS	TIOGA MUNI	7	0.008
49001	U52	UT	BEAVER	BEAVER MUNI	7	0.008
29097	MO16	MO	JASPER	BAUGH FLIGHT PARK	7	0.008
19135	4C8	IA	MONROE	ALBIA MUNI	7	0.008
20003	K68	KS	ANDERSON	GARNETT MUNI	7	0.008
29215	TVB	MO	TEXAS	CABOOL MEMORIAL	7	0.008
24039	W41	MD	SOMERSET	CRISFIELD MUNI	7	0.008
38021	2D5	ND	DICKEY	OAKES MUNI	7	0.008
56007	9U4	WY	CARBON	DIXON	7	0.008
38011	BPP	ND	BOWMAN	BOWMAN MUNI	7	0.008
48191	F21	TX	HALL	MEMPHIS MUNI	7	0.008
04001	D68	AZ	APACHE	TOWN OF SPRINGERVILLE M	7	0.008
15001	MUE	HI	HAWAII	WAIMEA-KOHALA	7	0.008
54081	BKW	WV	RALEIGH	RALEIGH COUNTY MEMORIAL	7	0.008
40117	95F	OK	PAWNEE	CLEVELAND MUNI	7	0.008
02185	BTI	AK	UPPER YUKON	BARTER ISLAND LRRS	7	0.008
46037	1D7	SD	DAY	THE SIGURD ANDERSON	7	0.008
01025	4R3	AL	CLARKE	JACKSON MUNI	7	0.008
46085	5P5	SD	LYMAN	PRESHO MUNI	7	0.008
46093	D07	SD	MEADE	FAITH MUNI	7	0.008
48195	E42	TX	HANSFORD	SPEARMAN MUNICIPAL	7	0.008
38001	HEI	ND	ADAMS	HETTINGER MUNI	7	0.008
38069	RUG	ND	PIERCE	RUGBY MUNI	7	0.008
01027	26A	AL	CLAY	ASHLAND/LINEVILLE	7	0.008
01009	20A	AL	BLOUNT	ROBBINS FIELD	7	0.008
49017	BCE	UT	GARFIELD	BRYCE CANYON	7	0.008
35027	F37	NM	LINCOLN	CARRIZOZO MUNI	7	0.007
31173	0C4	NE	THURSTON	PENDER MUNI	7	0.007
38067	2C8	ND	PEMBINA	CAVALIER MUNI	7	0.007
40055	2K4	OK	GREER	SCOTT FIELD	7	0.007
02240	6K8	AK	VALDEZ-CHITNA-WHITIE	TOK JUNCTION	7	0.007
02240	BIG	AK	FAIRBANKS	ALLEN AAF	7	0.007
38055	D05	ND	MC LEAN	GARRISON MUNI	7	0.007
20109	OEL	KS	LOGAN	OAKLEY MUNI	7	0.007
53051	S23	WA	PEND OREILLE	IONE MUNI	7	0.007
41049	9S9	OR	MORROW	LEXINGTON	7	0.007
19091	0K7	IA	HUMBOLDT	HUMBOLDT MUNI	7	0.007
20183	K82	KS	SMITH	SMITH CENTER MUNI	7	0.007
31175	ODX	NE	VALLEY	EVELYN SHARP FIELD	7	0.007
15007	PAK	HI	KAUAI	PORT ALLEN	7	0.007
49055	38U	UT	WAYNE	WAYNE WONDERLAND	7	0.007
39111	4G5	OH	MONROE	MONROE COUNTY	7	0.007

32003	0L7	NV	CLARK	JEAN	7	0.007
31045	CDR	NE	DAWES	CHADRON MUNI	7	0.007
47091	6A4	TN	JOHNSON	JOHNSON COUNTY	7	0.007
05065	37T	AR	IZARD	CALICO ROCK-IZARD COUNT	7	0.007
35007	AXX	NM	COLFAX	ANGEL FIRE	7	0.007
34037	3N5	NJ	SUSSEX	NEWTON	6	0.007
28051	19M	MS	HOLMES	C. A. MOORE	6	0.007
01035	GZH	AL	CONECUH	MIDDLETON FIELD	6	0.007
19009	ADU	IA	AUDUBON	AUDUBON COUNTY	6	0.007
18099	C65	IN	MARSHALL	PLYMOUTH MUNI	6	0.007
08009	8V7	CO	BACA	SPRINGFIELD MUNI	6	0.007
56017	THP	WY	HOT SPRINGS	HOT SPRINGS CO-THERMOPO	6	0.007
37053	ONX	NC	CURRITUCK	CURRITUCK COUNTY	6	0.007
41021	3S9	OR	GILLIAM	CONDON STATE PAULING FL	6	0.007
08081	CAG	CO	MOFFAT	CRAIG-MOFFAT	6	0.007
08061	9V7	CO	KIOWA	EADS MUNI	6	0.007
19065	3Y2	IA	FAYETTE	GEORGE L SCOTT MUNI	6	0.007
23017	0B1	ME	OXFORD	BETHEL REGIONAL	6	0.007
22081	0R7	LA	RED RIVER	THE RED RIVER	6	0.007
46121	0V6	SD	TODD	MISSION SIOUX	6	0.007
13165	2J5	GA	JENKINS	MILLEN	6	0.007
13123	49A	GA	GILMER	GILMER COUNTY	6	0.007
40071	4O3	OK	KAY	BLACKWELL-TONKAWA MUNI	6	0.007
23027	57B	ME	WALDO	ISLESBORO	6	0.007
02070	5A8	AK	BRISTOL BAY	ALEKNAGIK /NEW/	6	0.007
20071	5K2	KS	GREELEY	TRIBUNE MUNI	6	0.007
46129	9F8	SD	WALWORTH	HOVEN MUNI	6	0.007
24033	CGS	MD	PRINCE GEORGES	COLLEGE PARK	6	0.007
40141	FDR	OK	TILLMAN	FREDERICK MUNI	6	0.007
26039	GOV	MI	CRAWFORD	GRAYLING AAF	6	0.007
48211	HHF	TX	HEMPHILL	HEMPHILL COUNTY	6	0.007
54109	I16	WV	WYOMING	KEE FIELD	6	0.007
20025	K58	KS	CLARK	HAROLD KRIER FLD	6	0.007
05127	M27	AR	SCOTT	WALDRON MUNI	6	0.007
06049	49N	NY	SUFFOLK	LUFKER	6	0.007
06095	O45	OK	TEXAS	HOOKER MUNI	6	0.007
27137	ORB	MN	ST LOUIS	ORR REGIONAL	6	0.007
02290	RBY	AK	YUKON-KOYUKUK	RUBY	6	0.007
30039	U05	MT	GRANITE	RIDDICK FIELD	6	0.007
41055	35S	OR	SHERMAN	WASCO STATE	6	0.007
01073	2A3	AK	KODIAK	LARSEN BAY	6	0.007
31063	47V	NE	FRONTIER	CURTIS MUNI	6	0.007
02050	A61	AK	BETHEL	TUNTUTULIAK	6	0.007
20153	ADT	KS	RAWLINS	ATWOOD-RAWLINS COUNTY C	6	0.007
20077	ANY	KS	HARPER	ANTHONY MUNI	6	0.007
31041	BBW	NE	CUSTER	BROKEN BOW MUNI	6	0.007
29107	HIG	MO	LAFAYETTE	HIGGINSVILLE INDUSTRIAL	6	0.007
19007	TVK	IA	APPANOOSE	CENTERVILLE MUNI	6	0.007

40015	2O8	OK	CADDO	HINTON MUNI	6	0.007
19011	TZT	IA	BENTON	BELLE PLAINE MUNI	6	0.007
36039	1I5	NY	GREENE	FREEHOLD	6	0.007
26057	68R	MI	GRATIOT	HAMP	6	0.007
27015	D42	MN	BROWN	SPRINGFIELD MUNI	6	0.007
38079	06D	ND	ROLETTE	ROLLA MUNI	6	0.007
48017	2T1	TX	BAILEY	MULESHOE MUNICIPAL	6	0.007
54045	6L4	WV	LOGAN	LOGAN COUNTY	6	0.007
02188	AFM	AK	NORTHWEST ARCTIC	AMBLER	6	0.007
06019	C80	CA	FRESNO	NEW COALINGA MUNI	6	0.007
35013	E05	NM	DONA ANA	HATCH MUNI	6	0.007
48195	E19	TX	HANSFORD	GRUVER MUNI	6	0.007
48129	E34	TX	DONLEY	CLARENDON MUNI	6	0.007
08049	GNB	CO	GRAND	GRANBY-GRAND COUNTY	6	0.007
05071	H35	AR	JOHNSON	CLARKSVILLE MUNI	6	0.007
21027	I93	KY	BRECKINRIDGE	BRECKINRIDGE COUNTY	6	0.007
35053	N29	NM	SOCORRO	MAGDALENA	6	0.007
48321	PSX	TX	MATAGORDA	PALACIOS MUNI	6	0.007
40007	K44	OK	BEAVER	BEAVER MUNI	6	0.007
48331	T35	TX	MILAM	CAMERON MUNI AIRPARK	6	0.007
49037	U96	UT	SAN JUAN	CAL BLACK MEMORIAL	6	0.007
17117	IS2	IL	MACOUPIN		6	0.007
06051	O24	CA	MONO	LEE VINING	6	0.007
32017	1L1	NV	LINCOLN	LINCOLN COUNTY	6	0.007
31169	HJH	NE	THAYER	HEBRON MUNI	6	0.007
06053	KIC	CA	MONTEREY	MESA DEL REY	6	0.006
38101	7K5	ND	WARD	KENMARE MUNI	6	0.006
33017	DAW	NH	STRAFFORD	SKYHAVEN	6	0.006
26107	RQB	MI	MECOSTA	ROBEN-HOOD	6	0.006
21171	TZV	KY	MONROE	TOMPKINSVILLE-MONROE CO	6	0.006
56023	EMM	WY	LINCOLN	KEMMERER MUNI	6	0.006
41007	56S	OR	CLATSOP	SEASIDE MUNICIPAL	6	0.006
02290	6A8	AK	YUKON-KOYUKUK	NEW ALLAKAKET	6	0.006
30057	7S1	MT	MADISON	TWIN BRIDGES	6	0.006
45025	PYG	SC	CHESTERFIELD	PAGELAND	6	0.006
15009	HNM	HI	MAUI	HANA	6	0.006
35019	I58	NM	GUADALUPE	SANTA ROSA ROUTE 66	6	0.006
30107	HWQ	MT	WHEATLAND	WHEATLAND COUNTY AT HAR	6	0.006
38045	4F9	ND	LA MOURE	LA MOURE ROTT MUNI	6	0.006
19175	CSQ	IA	UNION	CRESTON MUNI	6	0.006
20081	1K9	KS	HASKELL	SATANTA MUNI	6	0.006
31089	8V2	NE	HOLT	STUART-ATKINSON MUNI	6	0.006
29143	EIW	MO	NEW MADRID	COUNTY MEMORIAL	6	0.006
19157	GGI	IA	POWESHIEK	GRINNELL REGIONAL	6	0.006
31161	GRN	NE	SHERIDAN	GORDON MUNI	6	0.006
29005	K57	MO	ATCHISON	GOULD PETERSON MUNI	6	0.006
41019	16S	OR	DOUGLAS	MYRTLE CREEK MUNICIPAL	6	0.006
02231	GST	AK	SKAGWAY-YAKUTAT	GUSTAVUS	6	0.006

02290	TAL	AK	YUKON-KOYUKUK	RALPH M CALHOUN MEML	6	0.006
54097	W22	WV	UPSHUR	UPSHUR COUNTY RGNL	6	0.006
39069	OH17	OH	DELAWARE	AUGUST ACRES	5	0.006
27073	DXX	MN	LAC QUI PARLE	MADISON-LAC QUI PARLE C	5	0.006
40081	CQB	OK	LINCOLN	CHANDLER MUNI	5	0.006
02180	N93	AK	NOME	NEW GOLOVIN	5	0.006
47087	1A7	TN	JACKSON	JACKSON COUNTY	5	0.006
36103	0B8	NY	SUFFOLK	ELIZABETH FIELD	5	0.006
48231	2F7	TX	HUNT	COMMERCE MUNI	5	0.006
02290	FSP	AK	KUSKOKWIM	NIKOLAI	5	0.006
46097	8D9	SD	MINER	HOWARD MUNI	5	0.006
40061	F84	OK	HASKELL	STIGLER MUNI	5	0.006
38053	S25	ND	MC KENZIE	WATFORD CITY MUNI	5	0.006
38039	S32	ND	GRIGGS	COOPERSTOWN MUNI	5	0.006
56003	U68	WY	BIG HORN	NORTH BIG HORN COUNTY	5	0.006
01065	7A0	AL	HALE	GREENSBORO MUNI	5	0.006
30053	88M	MT	LINCOLN	EUREKA	5	0.006
01105	A08	AL	PERRY	VAIDEN FIELD	5	0.006
31095	FBY	NE	JEFFERSON	FAIRBURY MUNICIPAL	5	0.006
26131	OGM	MI	ONTONAGON	ONTONAGON COUNTY	5	0.006
19167	ORC	IA	SIOUX	ORANGE CITY MUNI	5	0.006
31033	SNY	NE	CHEYENNE	SIDNEY MUNI	5	0.006
55017	WI18	WI	CHIPPEWA	GATEWAY	5	0.006
40087	3O3	OK	MC CLAIN	PURCELL MUNI	5	0.006
50005	6B8	VT	CALEDONIA	CALEDONIA COUNTY	5	0.006
30011	97M	MT	CARTER	EKALAKA	5	0.006
30033	JDN	MT	GARFIELD	JORDAN	5	0.006
51135	BKT	VA	NOTTOWAY	ALLEN C PERKINSON/BAAF	5	0.006
13127	09J	GA	GLYNN	JEKYLL ISLAND	5	0.006
20195	0H1	KS	TREGO	TREGO WAKEENEY	5	0.006
13243	25J	GA	RANDOLPH	CUTHBERT-RANDOLPH	5	0.006
38031	46D	ND	FOSTER	CARRINGTON MUNI	5	0.006
13163	65J	GA	JEFFERSON	WRENS MEMORIAL	5	0.006
02280	68A	AK	WRANGELL-PETERSBURG	WRANGELL	5	0.006
21175	9I3	KY	MORGAN	WEST LIBERTY	5	0.006
06093	A32	CA	SISKIYOU	BUTTE VALLEY	5	0.006
38023	D50	ND	DIVIDE	CROSBY MUNI	5	0.006
04001	E91	AZ	APACHE	CHINLE MUNI	5	0.006
02240	EAA	AK	UPPER YUKON	EAGLE	5	0.006
39131	EOP	OH	PIKE	PIKE COUNTY	5	0.006
32023	GAB	NV	NYE	GABBS	5	0.006
02050	GNU	AK	BETHEL	GOODNEWS	5	0.006
02188	IAN	AK	KOBUK	BOB BAKER MEML	5	0.006
02290	NUL	AK	YUKON-KOYUKUK	NULATO	5	0.006
42051	P45	PA	FAYETTE	MOUNT PLEASANT/SCOTTDAL	5	0.006
02164	PTH	AK	ALEUTIAN ISLANDS	PORT HEIDEN	5	0.006
06115	F25	CA	YUBA	BROWNSVILLE	5	0.006
29223	PYN	MO	WAYNE	PIEDMONT MUNI	5	0.005

06045	O09	CA	MENDOCINO	ROUND VALLEY	5	0.005
31017	ANW	NE	BROWN	AINSWORTH MUNI	5	0.005
29155	M05	MO	PEMISCOT	CARUTHERSVILLE MEMORIAL	5	0.005
31101	OGA	NE	KEITH	SEARLE FIELD	5	0.005
29111	6M6	MO	LEWIS	LEWIS COUNTY REGIONAL	5	0.005
31077	99Y	NE	GREELEY	GREELEY MUNI	5	0.005
12025	X44	FL	MIAMI-DADE	MIAMI	5	0.005
01039	0J4	AL	COVINGTON	FLORALA MUNI	5	0.005
19053	LWD	IA	DECATUR	LAMONI MUNI	5	0.005
01023	09A	AL	CHOCTAW	BUTLER-CHOCTAW COUNTY	5	0.005
04003	P04	AZ	COCHISE	BISBEE MUNI	5	0.005
46101	4P3	SD	MOODY	FLANDREAU MUNI	5	0.005
40005	AQR	OK	ATOKA	ATOKA MUNI	5	0.005
38019	D55	ND	CAVALIER	ROBERTSON FIELD	5	0.005
31181	7V7	NE	WEBSTER	RED CLOUD MUNI	5	0.005
02231	PEC	AK	SKAGWAY-YAKUTAT	PELICAN	5	0.005
45061	52J	SC	LEE	LEE COUNTY	5	0.005
30099	CII	MT	TETON	CHOTEAU	5	0.005
18117	I42	IN	ORANGE	PAOLI MUNI	5	0.005
19077	GCT	IA	GUTHRIE	GUTHRIE COUNTY REGIONAL	5	0.005
31075	1V2	NE	GRANT	GRANT COUNTY	5	0.005
38035	4V4	ND	GRAND FORKS	NORTHWOOD MUNI-VINCE FI	5	0.005
02270	2A9	AK	WADE HAMPTON	KOTLIK/NEW	5	0.005
46089	3W8	SD	MC PHERSON	EUREKA MUNI	5	0.005
12099	X10	FL	PALM BEACH	BELLE GLADE STATE MUNIC	5	0.005
04015	U30	AZ	MOHAVE	TEMPLE BAR	4	0.005
02070	A63	AK	BETHEL	TWIN HILLS	4	0.005
19025	2Y4	IA	CALHOUN	ROCKWELL CITY MUNI	4	0.005
46071	5V8	SD	JACKSON	KADOKA MUNI	4	0.005
02261	CXC	AK	VALDEZ-CHITNA-WHITIE	CHITINA	4	0.005
02180	TER	AK	NOME	TELLER	4	0.005
06067	MCC	CA	SACRAMENTO	MC CLELLAN AIRFIELD	4	0.005
02290	TCT	AK	KUSKOKWIM	TAKOTNA	4	0.005
47135	M15	TN	PERRY	PERRY COUNTY	4	0.005
31161	9V5	NE	SHERIDAN	MODISETT	4	0.005
31069	OKS	NE	GARDEN	GARDEN COUNTY	4	0.005
49009	40U	UT	DAGGETT	MANILA	4	0.005
49039	41U	UT	SANPETE	MANTI-EPHRAIM	4	0.005
38029	7L2	ND	EMMONS	LINTON MUNI	4	0.005
02231	SGY	AK	SKAGWAY-YAKUTAT	SKAGWAY	4	0.005
22065	TVR	LA	MADISON	VICKSBURG TALLULAH RGNL	4	0.005
02150	KKB	AK	KODIAK	KITOI BAY	4	0.005
19197	CAV	IA	WRIGHT	CLARION MUNI	4	0.005
04019	P01	AZ	PIMA	AJO MUNI	4	0.005
02150	KPY	AK	KODIAK	PORT BAILEY	4	0.005
04015	1G4	AZ	MOHAVE	GRAND CANYON WEST	4	0.005
37025	3N8	MN	MAHNOMEN	MAHNOMEN COUNTY	4	0.005
02261	7KA	AK	VALDEZ-CHITNA-	TATITLEK	4	0.005

			WHITIE			
29055	UBX	MO	CRAWFORD	CUBA MUNI	4	0.005
08085	AIB	CO	MONTROSE	HOPKINS FIELD	4	0.004
20185	3TA	KS	STAFFORD	STAFFORD MUNI	4	0.004
40077	H05	OK	LATIMER	WILBURTON MUNI	4	0.004
38067	PMB	ND	PEMBINA	PEMBINA MUNI	4	0.004
36091	W57	NY	SARATOGA	ROUND LAKE	4	0.004
72013	ABO	PR		ANTONIO/NERY/JUARBE POL	4	0.004
32019	SPZ	NV	LYON	SILVER SPRINGS	4	0.004
19133	MEY	IA	MONONA	JAMES G. WHITING MEML F	4	0.004
06023	D63	CA	HUMBOLDT	DINSMORE	4	0.004
01005	11A	AL	BARBOUR	CLAYTON MUNI	4	0.004
31163	0F4	NE	SHERMAN	LOUP CITY MUNI	4	0.004
29015	RAW	MO	BENTON	WARSAW MUNI	4	0.004
46033	CUT	SD	CUSTER	CUSTER COUNTY	4	0.004
38061	08D	ND	MOUNTRAIL	STANLEY MUNI	4	0.004
22079	ESF	LA	RAPIDES	ESLER REGIONAL	4	0.004
35039	24N	NM	RIO ARRIBA	JICARILLA APACHE NATION	4	0.004
41045	26U	OR	MALHEUR	MC DERMITT STATE	4	0.004
48323	5T9	TX	MAVERICK	MAVERICK COUNTY MEML IN	4	0.004
22071	7N0	LA	ORLEANS	NEW ORLEANS DOWNTOWN	4	0.004
22123	9M6	LA	WEST CARROLL	KELLY	4	0.004
30061	9S4	MT	MINERAL	MINERAL COUNTY	4	0.004
02231	AGN	AK	SITKA	ANGOON	4	0.004
02050	CFK	AK	BETHEL	CHEFORNAK	4	0.004
40075	HBR	OK	KIOWA	HOBART MUNI	4	0.004
02290	KGX	AK	KUSKOKWIM	GRAYLING	4	0.004
72053	PR03	PR		FAJARDO HARBOR	4	0.004
02290	Z84	AK	YUKON-KOYUKUK	CLEAR	4	0.004
02164	KCL	AK	ALEUTIAN ISLANDS	CHIGNIK LAGOON	4	0.004
20065	HLC	KS	GRAHAM	HILL CITY MUNI	4	0.004
20147	PHG	KS	PHILLIPS	PHILLIPSBURG MUNI	4	0.004
31129	12K	NE	NUCKOLLS	SUPERIOR MUNI	4	0.004
31107	6K3	NE	KNOX	CREIGHTON MUNI	4	0.004
31149	RBE	NE	ROCK	ROCK COUNTY	4	0.004
40151	1K5	OK	WOODS	WAYNOKA MUNI	4	0.004
02201	AKW	AK	PRINCE OF WALES	KLAWOCK	4	0.004
06037	L70	CA	LOS ANGELES	AGUA DULCE AIRPARK	4	0.004
26133	9C8	MI	OSCEOLA	EVART MUNI	4	0.004
31023	93Y	NE	BUTLER	DAVID CITY MUNI	4	0.004
02261	15Z	AK	CORDOVA-MCCARTHY	MC CARTHY NR 2	4	0.004
40009	3O4	OK	BECKHAM	SAYRE MUNI	4	0.004
12025	HST	FL	MIAMI-DADE	HOMESTEAD ARB	4	0.004
49017	U55	UT	GARFIELD	PANGUITCH MUNI	4	0.004
31035	08K	NE	CLAY	HARVARD STATE	3	0.004
26119	Y93	MI	MONTMORENCY	ATLANTA MUNI	3	0.004
02290	MDR	AK	MEDFRA	Medfra Airport	3	0.004
02290	ANV	AK	KUSKOKWIM	ANVIK	3	0.004

02050	PTU	AK	BETHEL	PLATINUM	3	0.004
41037	62S	OR	LAKE	CHRISTMAS VALLEY	3	0.004
26141	PZQ	MI	PRESQUE ISLE	PRESQUE ISLE COUNTY	3	0.004
32027	LOL	NV	PERSHING	DERBY FIELD	3	0.004
02290	MLY	AK	YUKON-KOYUKUK	MANLEY HOT SPRINGS	3	0.004
02013	CDB	AK	ALEUTIAN ISLANDS	COLD BAY	3	0.004
39123	3W9	OH	OTTAWA	MIDDLE BASS-EAST POINT	3	0.004
40089	4O4	OK	MC CURTAIN	MC CURTAIN COUNTY RGNL	3	0.004
02290	51Z	AK	YUKON-KOYUKUK	MINTO /NEW/	3	0.004
02185	AQT	AK	NORTH SLOPE	NUIQSUT	3	0.004
40113	H92	OK	OSAGE	HOMINY MUNI	3	0.004
02290	HRR	AK	YUKON-KOYUKUK	HEALY RIVER	3	0.004
02164	TPO	AK	BRISTOL BAY	PORT ALSWORTH	3	0.004
21147	18I	KY	MC CREARY	MC CREARY COUNTY	3	0.003
02164	5NN	AK	BRISTOL BAY	NONDALTON	3	0.003
46031	5P2	SD	CORSON	MC LAUGHLIN MUNI	3	0.003
30027	9S7	MT	FERGUS	WINIFRED	3	0.003
01025	3A0	AL	CLARKE	GROVE HILL MUNI	3	0.003
02130	KTN	AK	KETCHIKAN	KETCHIKAN INTL	3	0.003
31041	09K	NE	CUSTER	SARGENT MUNI	3	0.003
38055	5C8	ND	MC LEAN	WASHBURN MUNI	3	0.003
28155	06M	MS	WEBSTER	EUPORA	3	0.003
02070	MBA	AK	BRISTOL BAY	MANOKOTAK	3	0.003
02290	5Z5	AK	YUKON-KOYUKUK	KANTISHNA	3	0.003
38067	96D	ND	PEMBINA	WALHALLA MUNI	3	0.003
02050	DUY	AK	BETHEL	KONGIGANAK	3	0.003
36031	N25	NY	ESSEX	WESTPORT	3	0.003
02013	SDP	AK	ALEUTIAN ISLANDS	SAND POINT	3	0.003
02180	SHH	AK	NOME	SHISHMAREF/NEW	3	0.003
02188	DCK	AK	KOBUK	DAHL CREEK	3	0.003
35045	5V5	NM	SAN JUAN	SHIPROCK AIRSTRIP	3	0.003
30073	7S7	MT	PONDERA	VALIER	3	0.003
02185	AWI	AK	BARROW	WAINWRIGHT	3	0.003
02050	EWU	AK	BETHEL	NEWTOK	3	0.003
38041	3P3	ND	HETTINGER	MOTT MUNI	3	0.003
38075	HBC	ND	RENVILLE	MOHALL MUNI	3	0.003
02150	KOY	AK	KODIAK	OLGA BAY	3	0.003
40037	3F7	OK	CREEK	JONES MEML	3	0.003
02290	CRC	AK	UPPER YUKON	CIRCLE CITY /NEW/	3	0.003
02188	DEE	AK	KOBUK	DEERING /NEW/	3	0.003
02270	RSH	AK	WADE HAMPTON	RUSSIAN MISSION	3	0.003
02290	WCR	AK	UPPER YUKON	CHANDALAR LAKE	3	0.003
02180	WMO	AK	NOME	WHITE MOUNTAIN	3	0.003
29169	TBN	MO	PULASKI	WAYNESVILLE RGNL ARPT A	3	0.003
17125	9I0	IL	MASON	HAVANA REGIONAL	3	0.003
32011	05U	NV	EUREKA	EUREKA	3	0.003
18123	TEL	IN	PERRY	PERRY COUNTY MUNI	3	0.003
02164	4K0	AK	BRISTOL BAY	PEDRO BAY	3	0.003

02180	IWK	AK	NOME	WALES	3	0.003
38103	5H4	ND	WELLS	HARVEY MUNI	3	0.003
39143	S24	OH	SANDUSKY	SANDUSKY COUNTY REGIONA	3	0.003
38033	20U	ND	GOLDEN VALLEY	BEACH	3	0.003
12013	F95	FL	CALHOUN	CALHOUN COUNTY	3	0.003
02050	16A	AK	BETHEL	NUNAPITCHUK	3	0.003
48237	21F	TX	JACK	JACKSBORO MUNI	3	0.003
39123	3X5	OH	OTTAWA	NORTH BASS ISLAND	3	0.003
31083	4D9	NE	HARLAN	ALMA MUNICIPAL	3	0.003
13025	4J1	GA	BRANTLEY	BRANTLEY COUNTY	3	0.003
22027	5F4	LA	CLAIBORNE	HOMER MUNICIPAL	3	0.003
40121	91F	OK	PITTSBURG	ARROWHEAD	3	0.003
51117	AVC	VA	MECKLENBURG	MECKLENBURG-BRUNSWICK R	3	0.003
40059	BFK	OK	HARPER	BUFFALO MUNI	3	0.003
02180	ELI	AK	NOME	ELIM	3	0.003
49055	HVE	UT	WAYNE	HANKSVILLE	3	0.003
46113	IEN	SD	SHANNON	PINE RIDGE	3	0.003
02050	IIK	AK	BETHEL	KIPNUK	3	0.003
02180	K29	AK	NOME	COUNCIL	3	0.003
28111	M59	MS	PERRY	RICHTON-PERRY COUNTY	3	0.003
02290	MHM	AK	YUKON-KOYUKUK	MINCHUMINA	3	0.003
02188	OBU	AK	KOBUK	KOBUK	3	0.003
36089	OGS	NY	ST LAWRENCE	OGDENSBURG INTL	3	0.003
45043	PHH	SC	GEORGETOWN	ROBERT F SWINNIE	3	0.003
53037	S93	WA	KITTITAS	CLE ELUM MUNI	3	0.003
56013	U25	WY	FREMONT	DUBOIS MUNI	3	0.003
49013	U69	UT	DUCHESNE	DUCHESNE MUNI	3	0.003
02188	WTK	AK	KOBUK	NOATAK	3	0.003
35031	ZUN	NM	MC KINLEY	BLACK ROCK	3	0.003
19051	4K6	IA	DAVIS	BLOOMFIELD MUNI	2	0.003
31071	BUB	NE	GARFIELD	CRAM FIELD	2	0.003
31049	CNP	NE	DEUEL	BILLY G RAY FIELD	2	0.003
06023	O21	CA	HUMBOLDT	HOOPA	2	0.003
02070	KKU	AK	BRISTOL BAY	EKUK	2	0.003
32023	BTY	NV	NYE	BEATTY	2	0.003
02164	9Z8	AK	BRISTOL BAY	LEVELOCK	2	0.003
23021	44B	ME	PISCATAQUIS	CHARLES A. CHASE JR. ME	2	0.002
40129	93F	OK	ROGER MILLS	MIGNON LAIRD MUNI	2	0.002
13065	HOE	GA	CLINCH	HOMERVILLE	2	0.002
04001	P34	PA	JUNIATA	MIFFLINTOWN	2	0.002
40081	SUD	OK	LINCOLN	STROUD MUNI	2	0.002
48123	T71	TX	DE WITT	CUERO MUNI	2	0.002
32015	9U3	NV	LANDER	AUSTIN	2	0.002
41035	2S7	OR	KLAMATH	CHILOQUIN STATE	2	0.002
02070	93AK	AK	BRISTOL BAY	THE QUEENS	2	0.002
02290	Z91	AK	FAIRBANKS NORTH STAR	BIRCH CREEK	2	0.002
36029	O01	NY	ERIE	HEUSSLER HAMBURG	2	0.002
05129	4A5	AR	SEARCY	SEARCY COUNTY	2	0.002

36031	4B7	NY	ESSEX	SCHROON LAKE	2	0.002
17031	4H1	IL	COOK	Schaumburg Municipal Helistop	2	0.002
36083	5B7	NY	RENSSELAER	RENSSELAER COUNTY	2	0.002
21055	5M9	KY	CRITTENDEN	MARION-CRITTENDEN COUNT	2	0.002
02201	84K	AK	KETCHIKAN	MEYERS CHUCK	2	0.002
30079	8U6	MT	PRAIRIE	TERRY	2	0.002
02270	AUK	AK	WADE HAMPTON	ALAKANUK	2	0.002
02290	HLA	AK	YUKON-KOYUKUK	HUSLIA	2	0.002
20201	K38	KS	WASHINGTON	WASHINGTON COUNTY MEMOR	2	0.002
02231	OOH	AK	SKAGWAY-YAKUTAT	HOONAH	2	0.002
02188	WLK	AK	KOBUK	SELAWIK	2	0.002
02290	HUS	AK	YUKON-KOYUKUK	HUGHES	2	0.002
02261	IEM	AK	VALDEZ-CHITNA-WHITIE	WHITTIER	2	0.002
22049	F88	LA	JACKSON	JONESBORO	2	0.002
02270	MDM	AK	WADE HAMPTON	MARSHALL	2	0.002
02270	MOU	AK	WADE HAMPTON	MOUNTAIN VILLAGE	2	0.002
38061	Y74	ND	MOUNTRAIL	PARSHALL-HANKINS	2	0.002
32003	0L9	NV	CLARK	ECHO BAY	2	0.002
31133	50K	NE	PAWNEE	PAWNEE CITY MUNICIPAL	2	0.002
49017	1L7	UT	GARFIELD	ESCALANTE MUNI	2	0.002
02164	A79	AK	ALEUTIAN ISLANDS	CHIGNIK LAKE	2	0.002
02270	0AK	AK	WADE HAMPTON	PILOT STATION	2	0.002
40033	3O5	OK	COTTON	WALTERS MUNI	2	0.002
40003	4O5	OK	ALFALFA	CHEROKEE MUNI	2	0.002
05039	5M4	AR	DALLAS	H L HOPKINS-FORDYCE MUN	2	0.002
04001	85V	AZ	APACHE	GANADO	2	0.002
40015	86F	OK	CADDO	CARNEGIE MUNI	2	0.002
02201	KCC	AK	PRINCE OF WALES	COFFMAN COVE	2	0.002
02070	KEK	AK	BRISTOL BAY	EKWOK	2	0.002
02070	KNW	AK	BRISTOL BAY	NEW STUYAHOK	2	0.002
40053	O53	OK	GRANT	MEDFORD MUNI	2	0.002
02150	WSJ	AK	KODIAK	SAN JUAN /UGANIK/	2	0.002
28161	33M	MS	YALOBUSHA	WATER VALLEY MUNI	2	0.002
02050	4KA	AK	BETHEL	TUNUNAK	2	0.002
28073	4R1	MS	LAMAR	I H BASS JR MEMORIAL	2	0.002
46137	84D	SD	ZIEBACH	CHEYENNE EAGLE BUTTE	2	0.002
28019	9M4	MS	CHOCTAW	ACKERMAN CHOCTAW COUNTY	2	0.002
40149	F36	OK	WASHITA	CORDELL MUNI	2	0.002
40105	H66	OK	NOWATA	NOWATA MUNI	2	0.002
20021	K67	KS	CHEROKEE	OSWEGO MUNI	2	0.002
02180	KKA	AK	NOME	KOYUK	2	0.002
02188	D76	AK	KOBUK	ROBERT /BOB/ CURTIS MEM	2	0.002
02290	WBQ	AK	UPPER YUKON	BEAVER	2	0.002
47181	M29	TN	WAYNE	HASSELL FIELD	1	0.002
02201	4Z7	AK	KETCHIKAN	HYDER	1	0.002
02150	KWP	AK	KODIAK	WEST POINT VILLAGE	1	0.002
02013	KFP	AK	ALEUTIAN ISLANDS	FALSE PASS	1	0.002

02050	OOK	AK	WADE HAMPTON	TOKSOOK BAY	1	0.002
19097	OQW	IA	JACKSON	MAQUOKETA MUNI	1	0.002
35003	T16	NM	CATRON	RESERVE	1	0.001
39007	7G2	ND	SHERIDAN	MC CLUSKY MUNI	1	0.001
02290	CXF	AK	UPPER YUKON	COLDFOOT	1	0.001
01119	23A	AL	SUMTER	MALLARD	1	0.001
40019	1F1	OK	CARTER	LAKE MURRAY STATE PARK	1	0.001
02150	4K5	AK	KODIAK	OUZINKIE	1	0.001
02070	A14	AK	BRISTOL BAY	PORTAGE CREEK	1	0.001
02201	CGA	AK	PRINCE OF WALES	CRAIG	1	0.001
02100	EXI	AK	SKAGWAY-YAKUTAT	EXCURSION INLET	1	0.001
02050	IGT	AK	BETHEL	NIGHTMUTE	1	0.001
02280	KAE	AK	WRANGELL-PETERSBURG	KAKE	1	0.001
02290	KAL	AK	YUKON-KOYUKUK	KALTAG	1	0.001
22057	GAO	LA	LAFOURCHE	SOUTH LAFOURCHE	1	0.001
02150	ORI	AK	KODIAK	PORT LIONS	1	0.001
02185	PHO	AK	KOBUK	POINT HOPE	1	0.001
02290	SVS	AK	UPPER YUKON	STEVENS VILLAGE	1	0.001
02050	WNA	AK	BETHEL	NAPAKIAK	1	0.001
29151	1H3	MO	OSAGE	LINN STATE TECHNICAL CO	1	0.001
35025	E04	NM	LEA	EUNICE	1	0.001
53009	UIL	WA	CLALLAM	QUILLAYUTE	1	0.001
30049	3U7	MT	LEWIS AND CLARK	BENCHMARK	1	0.001
02280	AHP	AK	WRANGELL-PETERSBURG	PORT ALEXANDER	1	0.001
02180	AK75	AK		Candle 2 Airport	1	0.001
02290	PPC	AK	UPPER YUKON	PROSPECT CREEK	1	0.001
11001	09W	DC	WASHINGTON	SOUTH CAPITOL STREET	1	0.001
01067	0J0	AL	HENRY	ABBEVILLE MUNI	1	0.001
28057	11M	MS	ITAWAMBA	FULTON-ITAWAMBA COUNTY	1	0.001
50021	1B3	VT	RUTLAND	FAIR HAVEN MUNI	1	0.001
02185	AKP	AK	YUKON-KOYUKUK	ANAKTUVUK PASS	1	0.001
40099	F30	OK	MURRAY	SULPHUR MUNI	1	0.001
38057	HZE	ND	MERCER	MERCER COUNTY REGIONAL	1	0.001
48433	T60	TX	STONEWALL	STONEWALL COUNTY	1	0.001
02231	TKE	AK	SITKA	TENAKEE	1	0.001
02290	VEE	AK	UPPER YUKON	VENETIE	1	0.001
02150	AKK	AK	KODIAK	AKHIOK	1	0.001
08055	07V	CO	HUERFANO	CUCHARA VALLEY AT LA VE	1	0.001
06089	0Q6	CA	SHASTA	SHINGLETOWN	1	0.001
50003	5B5	ND	LOGAN	NAPOLEON MUNI	1	0.001
02201	96Z	AK	PRINCE OF WALES	NORTH WHALE	1	0.001
02240	CKX	AK	UPPER YUKON	CHICKEN	1	0.001
02201	KTB	AK	PRINCE OF WALES	THORNE BAY	1	0.001
40081	O47	OK	LINCOLN	PRAGUE MUNI	1	0.001
02231	HWI	AK	SKAGWAY-YAKUTAT	HAWK INLET	1	0.001
02270	SXP	AK	WADE HAMPTON	SHELDON POINT	1	0.001
51047	W49	WA	SAN JUAN	ROSARIO	1	0.001

02240	4AK8	AK	FAIRBANKS	TETLIN	1	0.001
46047	6V0	SD	FALL RIVER	EDGEMONT MUNI	1	0.001
02164	AK5	AK	ALEUTIAN ISLANDS	PERRYVILLE	1	0.001
35047	E89	NM	SAN MIGUEL	CONCHAS STATE PARK	1	0.001
35011	FSU	NM	DE BACA	FORT SUMNER MUNI	1	0.001
40045	GAG	OK	ELLIS	GAGE	1	0.001
02270	HPB	AK	WADE HAMPTON	HOOPER BAY	1	0.001
02013	KVC	AK	ALEUTIAN ISLANDS	KING COVE	1	0.001
02201	KXA	AK	PRINCE OF WALES	KASAAN	1	0.001
02290	KYU	AK	YUKON-KOYUKUK	KOYUKUK	1	0.001
02050	MYU	AK	BETHEL	MEKORYUK	1	0.001
39077	OH21	OH	CRAWFORD	HORNING	1	0.001
02050	PKA	AK	BETHEL	NAPASKIAK	1	0.001
35039	E14	NM	RIO ARRIBA	SAN JUAN PUEBLO	1	0.001
38079	S28	ND	ROLETTE	INTL PEACE GARDEN	1	0.001
02270	SCM	AK	WADE HAMPTON	SCAMMON BAY	1	0.001
02188	SHG	AK	KOBUK	SHUNGNAK	1	0.001
02290	SHX	AK	KUSKOKWIM	SHAGELUK	1	0.001
02270	VAK	AK	WADE HAMPTON	CHEVAK	1	0.001
48109	VHN	TX	CULBERSON	CULBERSON COUNTY	1	0.001
02180	HAY	AK	NOME	HAYCOCK	1	0.001
02261	MYK	AK	CORDOVA-MCCARTHY	MAY CREEK	1	0.001
32009	0L5	NV	ESMERALDA	GOLDFIELD	1	0.001
02185	GBH	AK	NOME	GALBRAITH LAKE	1	0.001
02201	KPB	AK	PRINCE OF WALES	POINT BAKER	1	0.001
02290	WSM	AK	YUKON-KOYUKUK	WISEMAN	1	0.001
15001	UPP	HI	HAWAII	UPOLU	1	0.001
02201	19P	AK	PRINCE OF WALES	PORT PROTECTION	1	0.001
02100	3Z9	AK	HAINES	HAINES	1	0.001
02122	5HO	AK	SEWARD	HOPE	1	0.001
02231	7K2	AK	SKAGWAY-YAKUTAT	SKAGWAY	1	0.001
08115	7V8	CO	SEDGWICK	JULESBURG MUNI	1	0.001
35055	N24	NM	TAOS	QUESTA MUNI NR 2	1	0.001
78030	VI22	VI	-VIRGIN ISLANDS-	CHARLOTTE AMALIE HARBOR	1	0.001
35025	E07	NM	LEA	TATUM	1	0.001
35007	Q42	NM	COLFAX	SPRINGER MUNI	1	0.001
02170	Z55	AK	VALDEZ-CHITNA-WHITIE	LAKE LOUISE	1	0.001
38045	51D	ND	LA MOURE	EDGELEY MUNI	1	0.001
31127	K01	NE	NEMAHA	FARINGTON FIELD	1	0.001
40091	0F7	OK	MC INTOSH	FOUNTAINHEAD LODGE AIRP	1	0.001
35045	1V0	NM	SAN JUAN	NAVAJO STATE PARK	1	0.001
02231	2Y3	AK	SKAGWAY-YAKUTAT	YAKUTAT	1	0.001
02016	ADK	AK	ALEUTIAN ISLANDS	ADAK	1	0.001
02231	ELV	AK	SKAGWAY-YAKUTAT	ELFIN COVE	1	0.001
40117	H97	OK	PAWNEE	PAWNEE MUNI	1	0.001
05029	MPJ	AR	CONWAY	PETIT JEAN PARK	1	0.001
02122	PGM	AK	KENAI-COOK INLET	PORT GRAHAM	1	0.001
38085	Y27	ND	SIOUX	STANDING ROCK	1	0.001

02220	BNF	AK	WRANGELL-PETERSBURG	WARM SPRING BAY	0.5	0.001
38063	5L0	ND	NELSON	LAKOTA MUNI	0.4	0.00047
02016	AKA	AK	UNORGANIZED	ATKA	0.4	0.00042
02240	BYA	AK	UPPER YUKON	BOUNDARY	0.4	0.00042
02290	CIK	AK	UPPER YUKON	CHALKYITSIK	0.4	0.00042
02180	SVA	AK	NOME	SAVOONGA	0.4	0.00042
02231	FNR	AK	ANGOON	FUNTER BAY	0.3	0.00038
38059	D57	ND	MORTON	GLEN ULLIN REGIONAL	0.3	0.00033
54047	I25	WV	MC DOWELL	WELCH MUNI	0.3	0.00030
40069	0F9	OK	JOHNSTON	TISHOMINGO AIRPARK	0.3	0.00028
06071	49X	CA	SAN BERNARDINO	CHEMEHUEVI VALLEY	0.3	0.00028
40077	6F1	OK	LATIMER	TALIHINA MUNI	0.3	0.00028
02261	CZN	AK	FAIRBANKS	CHISANA	0.3	0.00028
40019	F32	OK	CARTER	HEALDTON MUNI	0.3	0.00028
02201	HYL	AK	PRINCE OF WALES	HOLLIS	0.3	0.00028
02122	KEB	AK	KENAI-COOK INLET	ENGLISH BAY	0.3	0.00028
02050	KKI	AK	BETHEL	AKIACHAK	0.3	0.00028
02188	KVL	AK	KODIAK ISLAND	KIVALINA	0.3	0.00028
02050	KWT	AK	BETHEL	KWETHLUK	0.3	0.00028
40001	O11	OK	ADAIR	STILWELL/CHEROKEE NATIO	0.3	0.00028
02290	PCK	AK	YUKON-KOYUKUK	PORCUPINE CREEK	0.3	0.00028
02290	RMP	AK	YUKON-KOYUKUK	RAMPART	0.3	0.00028
02180	WBB	AK	NOME	STEBBINS	0.3	0.00028
02290	2K5	AK	KUSKOKWIM	TELIDA	0.2	0.00027
02220	CYM	AK	SITKA	CHATHAM	0.2	0.00026
02290	Z17	AK	KUSKOKWIM	OPHIR	0.2	0.00018
02050	AKI	AK	BETHEL	AKIAK	0.1	0.00014
02016	DUT	AK	ALEUTIAN ISLANDS	UNALASKA	0.1	0.00014
40091	F08	OK	MC INTOSH	EUFAULA MUNI	0.1	0.00014
02180	GAM	AK	NOME	GAMBELL	0.1	0.00014
02150	KMY	AK	KODIAK	MOSER BAY	0.1	0.00014
02150	KPR	AK	KODIAK	PORT WILLIAMS	0.1	0.00014
02180	KTS	AK	NOME	BREVIG MISSION	0.1	0.00014
06031	O18	OK	MAYES	BUZZARDS ROOST	0.1	0.00014
02016	SNP	AK	BETHEL	ST PAUL ISLAND	0.1	0.00014
32007	10U	NV	ELKO	OWYHEE	0.1	0.00013
32017	L92	NV	LINCOLN	ALAMO LANDING FIELD	0.1	0.00013
40107	F81	OK	OKFUSKEE	OKEMAH FLYING FIELD	0.1	0.00011
02164	KIB	AK	ALEUTIAN ISLANDS	IVANOF BAY	0.1	0.00011
40049	1K2	OK	GARVIN	LINDSAY MUNI	0.1	0.00008
02185	ATK	AK	NORTH SLOPE	ATQASUK EDWARD BURNELL	0.1	0.00008
02050	ZNC	AK	BETHEL	NYAC	0.1	0.00008
02185	PIZ	AK	BARROW	POINT LAY LRRS	0.1	0.00006
35003	E94	NM	CATRON	GLENWOOD-CATRON COUNTY	0.05	0.00005