After more than two years of the longest and deepest slump in aviation history, the makers of airplanes and their parts are setting their sights on a turnaround.

But when exactly that will happen depends, in part, on the graveyards. Stretched across thousands of acres in New Mexico, Arizona and California are huge parking lots where carriers mothballed hundreds of jets when the airline market began to seriously crater after Sept. 11, 2001. At the peak, more than 2,100 airplanes sat among the tumbleweeds -- about 14% of the world-wide jetliner fleet.

How fast -- and how many of -- those planes are returned to service or scrapped will help determine everything from how many jetliners Boeing Co. and rival Airbus build in 2004 to the financial outlooks for companies that make much of their profits by supplying spare parts for some of the jets that were parked.

Beyond that, the other major trend in aviation is that everybody seems to have a different vision of the future -- and is pursuing it vigorously. Airbus is banking on the planned A380, which will accommodate anywhere from 555 to 800 passengers, while Boeing thinks passengers will choose the comfort of its 7E7 Dreamliner, a smaller and faster jet. Meantime, smaller aircraft -- regional jets and minijets -- continue to make inroads into the market of their larger counterparts.

Here's a look at some specific trends.

1. Counting Tombstones

During an analysts meeting last year, Alan Mulally, president of Boeing Commercial Airplanes, joked that the company had some of its top minds working on ways to develop a strain of "aluminum-eating locusts" that could then be unleashed on the seas of jets parked in the deserts.

It wasn't a bad idea. At the time, almost 2,000 jets were mothballed, about 500 of which were new enough that they would likely be returned to service someday. For Boeing and Airbus, 500 jets waiting to be tapped is the equivalent of roughly one year's worth of combined production. In other words, every jet coming out of the desert equals a new one that won't be coming off the production lines anytime soon.
But things could be turning around. In December alone, the number of mothballed jets fell by 44 airplanes, while the active fleet -- planes being used by airlines -- increased by 86, according to several analysts and groups that track the so-called parked fleet. The increase, according to Jeffries & Co. analyst Sam Pearlstein, was driven by 51 new deliveries and 35 planes that left the parked fleet. More important, he says, airlines continued "a positive trend" of standing behind their orders, making it four months in a row that airlines have not canceled or deferred deliveries -- a common practice after 9/11.

There is an upside to old airplanes returning to service for spare-parts suppliers like Goodrich Corp., Pratt & Whitney and Rockwell Collins Inc. "The more these planes are flying," says Marshall Larsen, Goodrich's chairman and chief executive, "the more spare parts we sell."

2. Massive Planes, Massive Headaches?

In 2003, while sliding past Chicago-based Boeing to claim the title of the world's largest airplane manufacturer, Europe's Airbus began cutting metal for the massive A380. The airplane, which will seat as many as 800 passengers in some configurations, will supplant the Boeing 747 as the largest passenger jetliner in the world when it enters service in 2006.

Airbus is betting that the airplane, which it calls the "Eighth Wonder of the World," will help redefine air travel by enabling airlines to use the volume of seats aboard each aircraft to offer incredibly good fares on long-haul flights.

The question that passengers will face is whether they want to deal with what will almost certainly be gargantuan security hassles and logistics of getting aboard a plane with as many as 799 other people. "Can you imagine the baggage-claim area after a flight like that?" says Randy Baseler, a Boeing marketing executive whose job is to try to make the A380 seem as scary as possible.

Airbus points to sales. So far, it has firm orders for 129 A380s and more than 70 options for purchases at a later date.

3. Smaller and Faster

Boeing believes that most passengers would choose flying nonstop over connecting through a busy airline hub.

That is the basic marketing strategy of the company's decision to move away from larger airplanes like the A380 and focus, instead, on smaller jets with the range to hop over the hubs and deliver passengers directly to their destinations. Boeing is building a 250-seat airplane called the 7E7 Dreamliner. The "E" in the 7E7 stands for efficient, which is what the company says will be the chief selling point to airlines.

Boeing plans to use carbon-fiber panels, instead of aluminum, to create the fuselage, enabling designers to build in larger windows, as well as provide corrosion protection that will allow airlines to keep the inside air at higher humidity than is now possible on all-metal planes.

Boeing's board has given its sales force authority to offer the airplane for sale. Many in the industry expect a Japanese airline to be the first customer.
4. Defensive Moves

Defense spending is increasingly becoming the force that underpins the U.S. aviation industry. Almost on a weekly basis during 2003, one company or another announced that it had won a contract of $1 billion or more to build everything from the next generation of armored personnel carriers to missiles and the high-speed targets they will shoot down.

The importance of Pentagon spending is illustrated by Boeing's transformation. As recently as six years ago, the world's largest aerospace company at the time relied on commercial jets for as much as 85% of its revenue. Boeing says that thanks to several big wins on military programs, 54% of its $50.5 billion in revenue for 2003 came from military spending. That doesn't include an estimated $17 billion that the company stands to make from leasing and selling the Air Force 100 modified 767s for use as aerial tankers over the next 10 years.

The continuing unrest in the Middle East, as well as plans for revamping major military systems, will continue to make the Pentagon's watering trough popular. But look for increasing political pressure from the U.S.'s allies in Europe to give European aerospace manufacturers a shot at some contracts.

Already, a helicopter developed by AgustaWestland of Britain and Italy is being talked about as a possible replacement for President Bush's aging fleet of Marine One helicopters. Sikorsky helicopters, a United Technologies Corp. unit, is offering an all-new helicopter to keep the prestigious contract, which it has held since Dwight Eisenhower was president.

5. Surfing Above the Clouds

As business picks up, airlines are starting to differentiate themselves through the services they offer, especially on long-haul flights to and from Asia and Europe. One in particular is airborne Internet service.

Before the Sept. 11 terrorist attacks, Boeing was well along with its plans to install satellite-based high-speed Internet service aboard as many as 1,500 airplanes operated by AMR Corp.'s American Airlines, Delta Air Lines and UAL Corp.'s United Airlines to have begun in mid-2002. Those airlines pulled out in November 2001 and have yet to say when -- or whether -- they might be interested again.

However, Boeing has been gaining momentum for its service, called Connexion, with airlines in Europe and Asia. During this year's first quarter, it plans to begin full-scale commercial service on airlines owned by Lufthansa, Scandinavian Airlines System and Japan Airlines. Singapore Airlines, All-Nippon Airways and China Airlines have announced their intent to install the service on certain long-haul planes.

Connexion is the only inflight service announced so far that allows customers to send and receive e-mail and surf the Internet at speeds approaching those found in the office or on a home cable modem. At such speeds, Boeing says, passengers can watch Webcasts and even conduct live conference calls.

Two competitors, Seattle-based Tenzing Communications Inc. and New York-based Verizon Communications Inc., are pushing services that enable passengers to send and receive messages, but neither has announced plans to expand into the more complicated -- and expensive -- effort to provide broadband service.

Tenzing's service already is on more than 800 aircraft operated by Cathay Pacific Airways, Continental Airlines, Spain's Iberia Airlines, Northwest Airlines, United Airlines and Britain's Virgin Atlantic Airways. It recently added Dubai's Emirates. Airlines charge about $10 a flight for the e-mail capability.

Verizon's JetConnect, which is aimed at airlines that have phones mounted in the seats, is priced at $5.95
per flight and is offered on certain jetliners operated by United Airlines and Continental.

6. Looking East

The Asian market is becoming increasingly important to the aerospace industry. China alone is expected to be the largest market for commercial airplanes outside the U.S. during the next two decades. According to Boeing's most recent forecast, airlines in China are expected to buy as many as 2,150 airplanes over that period to accommodate an estimated 7.1% annual growth in passenger traffic.

Of course, Boeing won't sell all of the planes itself. Airbus is doing its best to take at least 50% of the market for larger jets. At the same time, the fledgling Chinese aerospace industry is developing homegrown jets, particularly regional jets carrying fewer than 100 passengers.

Though Brazil's Empresa Brasileira de Aeronautica SA, or Embraer, and Canada's Bombardier Inc. have a huge lead with successful regional-jet programs of their own, the Chinese government is pouring enormous resources into developing a regional jet to compete with them. That project, a 78- to 98-seat jet called the ARJ-21, would be built by China Aviation Industry Corp. 1, known as AVIC-1. It hopes to have its planes in the air by 2008, and has already signed accords with several international suppliers, including General Electric Co. and Rockwell Collins.

Meanwhile, look for Japan to remain a major battleground for the big manufacturers, particularly as Airbus tries to use the A380 to unseat Boeing's 747 as the commuter airplane of choice. Japan has a huge commuter market that, so far, has been extremely loyal to Boeing.

Both companies have been eager to demonstrate their commitment to Japan by seeking manufacturing alliances with the country's three big manufacturing companies -- Mitsubishi Heavy Industries, Kawasaki Heavy Industries and Fuji Heavy Industries -- referred to as the "heavies." Most recently, Boeing agreed to turn over the prestigious wing-production contract for the coming 7E7 to these manufacturers as a way to cut its own development costs while also seeking outside investment in the aircraft. Airbus has raised concerns that such a scheme might violate trade agreements. Officials at Boeing and in Japan have said the deal is legal.

7. Corporations Take Off

Despite increased public attention on corporate extravagances, look for sales of corporate jets to improve, analysts say.

Part of this can be explained by a provision in a tax package Congress passed last May that allowed companies to depreciate 50% of the value of new business jets in the first year of ownership. That sparked new orders, but there was a catch: The jets have to be in the hands of their new owners by the end of 2004. Several of the manufacturers already are close to filling their order books for the year. Still, says Ed Bolen, executive director of the General Aviation Manufacturer's Association, the industry expects business-jet growth to be "positive and sustained" in the coming few years.

Demand also is being driven by the continuing popularity of fractional-ownership programs, in which individuals or companies purchase part interest in a jet and then are entitled to use it a certain number of hours each year. Another growing trend is jet cards, which enable passengers to purchase flight time without paying for the jet itself.

On the low end of the totem pole, a line of sassy new single-engine airplanes made by Cirrus Design Corp. of Duluth, Minn., has helped jump-start the market for airplanes typically used by private pilots. Among the features making the planes popular: a computerized cockpit with equipment once seen only
on commercial jets, and a built-in parachute that allows the aircraft to float gently to Earth in an emergency.

8. A Big Battle Over Small Jets

One of the most heated battles in aviation continues to be the race to see which of several companies can produce an affordable four- to six-passenger jet that might be attractive to private owners -- or even used as air taxis by people who now pay premium fares to fly first class on commercial airlines.

So far, contenders include Eclipse Aviation Corp., Textron Inc.'s Cessna, Adam Aircraft Industries, Avocet Aircraft LLC, Israel Aircraft Industries Ltd., Safire Aircraft, Diamond Aircraft and possibly Japanese car maker Honda Motor Corp. (Honda has flown a prototype of its twin-engine jet in North Carolina, but it has yet to commit to producing it.) The other companies have been talking up their proposals and working through technical challenges.

Proponents of small jets say these airplanes, ranging in cost from $1 million to $2 million, would become potentially affordable alternatives to piston-engine airplanes used by many small companies.

9. Regional Jets Gain More Ground

It looks like regional jets are here to stay. A case in point: Dallas-based Southwest Airlines -- which built its business model around flying only one type of airplane, Boeing's 737 -- says it's considering adding regional jets to its fleet to serve smaller cities.

And most of the major full-service carriers have been steadily replacing their existing fleets of turbo-prop airplanes with the jets, which can fly faster, higher and farther. The airlines have, so far, been able to get away with paying commuter pilots less than pilots who fly the larger airplanes.

Last year, Air Canada and JetBlue Airways placed large orders for Embraer's 93-seat Embraer 190, which is still in development. Boeing, Airbus and the rest of the U.S. airline industry took notice when low-cost JetBlue, one of the fastest-growing airlines in the U.S., ordered 100 of the planes last June in a deal worth an estimated $3 billion at list prices and took options to buy another 100.

10. Back to School

Drawn by the spate of new airplanes and an improving economy, more and more students are taking to the skies, according to the Aircraft Owners and Pilots Association, the biggest lobbying group for private pilots.

In early January, the organization announced that it now has 402,000 members, or nearly two-thirds of the entire U.S. pilot population.

The only cloud on the horizon is the continuing specter of terrorism. Despite the small size and relatively slow speeds of smaller aircraft, some security experts within the government view these general-aviation aircraft as a potential threat. The AOPA, the Experimental Aircraft Association and other pilots groups say they are working with the government to increase security at thousands of small airports nationwide.

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