

FLYING CLOUD AIRPORT

Long Term Comprehensive Plan Update

SUMMARY and RECOMMENDATION

I. GENERAL INFORMATION

The Flying Cloud Airport, located approximately 14 miles from downtown Minneapolis, is considered by the MAC to be a primary reliever airport for the Minneapolis – St. Paul International Airport (MSP). Its location in the southwest suburbs allow businesses to consider it an important part of their local operations. In a 2005 economic report prepared by MAC, its contribution to the local economy was estimated to be more than \$80 million annually.

The first grass strip at FCM appeared in 1943. When MAC acquired the airport in 1947, the airport had approximately 135 acres. Development in the 1950's included acquisition of an additional 409 acres. At the time, the airport experienced major modifications, including longer paved runways, expanded and improved hangar facilities, and the dedication of a new air traffic control tower in 1963. In 1989, MAC embarked on a planning and environmental study focusing on expanding the airport once again. The proposal included land acquisition, extension of the longest runway from 3,900 feet to 5,000 feet, and extension of the north parallel runway from 3,600 feet to 3,900 feet. The proposal included land acquisition as well which brought the total area to 860 acres. In 2004, the state environmental process was completed, and in 2008, the Federal Aviation Administration issued their Record of Decision approving the project. Construction began in 2008, and continues today.

II. FORECASTS

The number of aircraft operations (a landing or takeoff), the number of based aircraft at the airport and the forecasted change in the 20-year planning period were calculated as part of the LTCP Update. The forecasts assume the 5,000-foot runway is in place and in use. Forecast information was presented to the Commission in May 2009. It is shown in tabular form below.

Year	Baseline	High Forecast	Low Forecast
OPERATIONS			
2007	124,569	124,569	124,569
2010	99,540	127,443	69,757
2015	97,154	113,062	69,710
2020	106,030	145,273	74,776
2025	113,876	157,204	78,944
BASED AIRCRAFT			
2007	421	421	421
2010	420	426	416
2015	411	435	395
2020	406	442	372
2025	401	452	354

III. FACILITY REQUIREMENTS AND CONCEPTS ANALYZED FOR DEVELOPMENT

The Flying Cloud Airport is categorized as a B-II airport, meaning it serves airplanes with approach speeds less than 121 knots and wingspans up to but not including 79 feet. Aircraft in this category are typically less than 12,500 pounds, and include most single engine aircraft and light twin engine airplanes that can carry up to 10 passengers. Small to medium sized jet aircraft, over 12,500 pounds but less than 60,000 pounds, also fit within this category and currently operate at the airport. In addition, the new very-light-jets (VLJs) coming on the market will also be able to operate at Flying Cloud.

According to FAA runway length curve calculations, the 5,000-foot runway length accommodates 100% of the aircraft within this B-II category that weigh less than 12,500 pounds. It is estimated that less than 75% of the larger planes in the B-II category weighing more than 12,500 pounds are accommodated with the current runway length, even with reduced loads, in wet and slippery conditions.

A. CAPACITY

As shown in the forecasts for 2007, the number of operations was 124,569. The maximum number of operations the airport can handle, the annual service volume, is 355,000 operations based on the existing two parallel runways plus crosswind runway configuration. Therefore, from an airside standpoint, the airport is currently at 35% capacity. The baseline 2025 forecast number of operations is lower than 2007. Under the high scenario, the 157,204 forecasted number of operations in 2025 would result in 44% capacity. None of these figures trigger the need for additional runways at FCM.

The based aircraft registered for FCM is 421 aircraft. There are estimated to be 508 actual indoor hangar spaces at the airport, including the new south hangar area. This means the current landside capacity equates to about 83%. Under the high forecast, the based aircraft would reach 452, or about 89% capacity. No additional hangar areas are in demand within the planning period.

B. RUNWAY SAFETY AREAS

The runway safety areas (RSA) and runway object free areas (OFA) for the two parallel runways are currently, or being constructed to be fully compliant according to FAA standards. The crosswind Runway 18-36, however, currently has a non-compliant RSA and OFA at the Runway 36 end. Two different options were analyzed to address and correct the deficiency. See the attached Figures 1 and 2.

The first option involves shortening the overall runway length to achieve a compliant RSA and OFA. The second involves shifting the runway to the north and lengthening it to 2,800 feet while still achieving a compliant RSA and OFA.

Note that both alternatives also show a new roadway north of Runway 18-36. This perimeter road is being considered at the request of the FAA to provide an east-west landside route for vehicles, fuel trucks and MAC maintenance vehicles so they do not have to drive on or cross airfield pavements. The intention is to reduce the risk for runway incursions related to Runway 18-36.

Option 1. Shorten Runway 18-36 (Figure 1)

This alternative shortens the crosswind runway to create a compliant runway safety area and object free area. The runway would be shortened by 58-feet. The current length is 2,691-feet; the ultimate length would be 2,633-feet.

Alternative Includes:	<ul style="list-style-type: none">• Removing 58 feet of pavement, or repainting 58-feet as unusable by aircraft;• Relocating the taxiway connectors to match the new Runway 36 end;• Runway light location adjustments for the new length;• Working with Hennepin County to gain a minor amount of right-of-way to relocate the airport fence;• Relocating the airport fence along Flying Cloud Drive.
Beneficial Considerations:	<ul style="list-style-type: none">• Runway length and aircraft performance information indicate that the loss of runway length should not adversely impact the types of aircraft currently using this runway in crosswind conditions;• This is the lower cost option;• The taxiway configurations remain standard at both ends of the runway;• No environmental process is required.
Negative Considerations:	<ul style="list-style-type: none">• The runway length would be reduced by 58-feet;• The runway is already shorter than the recommended runway length for a crosswind runway.

An analysis of runway length requirements and wind coverage needs was completed for a variety of aircraft known to use Runway 18-36. The need for a crosswind runway is easily justified by the existing wind coverage, especially for the smallest aircraft operating at the airport. Aircraft weighing less than 12,500 pounds are typically more susceptible to crosswind conditions. The runway length does not meet the recommended standard and any loss of length should be avoided if possible. The recommended runway length is 3,900 feet to accommodate 100% of aircraft weighing less than 12,500 pounds. One physical constraint for such an option, however, is the existence of the Pioneer Trail roadway corridor, which is currently being upgraded by Hennepin County and the City of Eden Prairie to a 4-lane divided highway. There would be no way to route this roadway around a runway extension, and the cost for a tunnel scenario would be prohibitive. The runway end would also lie very close the edge of Staring Lake, which lies approximately 80-feet lower in elevation than where the runway end would be.

To accommodate 75% of the fleet of aircraft weighing less than 12,500 pounds the FAA recommends 2,800 feet (based upon the Runway Length Requirements Computer Program). Those aircraft most susceptible to crosswinds are virtually all in the 75% category.

Option 2. Shift and Lengthen Runway 18-36 to 2,800 feet (Figure 2)

This alternative shifts the crosswind runway to the north by 58-feet to create a compliant runway safety area and object free area and then adds an additional 109 feet of pavement for a total runway length of 2,800 feet.

Alternative Includes:	<ul style="list-style-type: none">• Removing 58 feet of pavement, or repainting 58-feet as unusable by aircraft at the Runway 36 end;• Constructing 167-feet of runway length at the Runway 18 end;• Relocating the taxiway connectors to match the new runway end at both ends of the runway;• Runway light adjustments for the new runway location;• Working with Hennepin County to gain a minor amount of right-of-way to relocate the airport fence;• Relocating the airport fence along Flying Cloud Drive.
Beneficial Considerations:	<ul style="list-style-type: none">• The runway would be lengthened to better serve aircraft that use it. It would accommodate 75% of the fleet of aircraft weighing less than 12,500 pounds. Those aircraft that need a crosswind runway are virtually all in the 75% category.
Negative Considerations:	<ul style="list-style-type: none">• The taxiway relocation at the north end slightly impacts the FBO;• This is a higher cost option due to the construction of pavement in addition to other costs;• Moving the runway end to the north has the potential to cause more obstructions to Runway 18 (i.e. Pioneer Trail, existing trees);• An environmental review process may be required.

Based on the analysis of the alternatives discussed above, MAC staff recommends Runway 18-36 be shifted 58' to the north and lengthened by 109' for a total length of 2,800 feet to create a compliant RSA and OFA (see Section VI. – Plan Recommendations) and better serve aircraft using the runway, especially during cross-wind operations.

The FAA will likely not provide federal funding for projects associated with Runway 18-36 unless a compliant runway safety and object free areas are achieved.

IV. LAND USE COMPATIBILITY

A. NOISE CONTOURS

In the Baseline 2007 noise contours there are no residential dwellings located in the 60 DNL and greater contours around Flying Cloud Airport. The 60 DNL contour contains approximately 0.87 square miles. The 65 DNL contour contains approximately 0.36 square miles. The entire 70 and 75 DNL contours are contained on the airport property, essentially overlying the areas immediately adjacent to the runways. The 2007 70 and 75 DNL contours contain 0.18 and 0.07 square miles respectively. The 2007 noise contours are shown in Figure 3.

The Forecast 2025 60 DNL noise contour around Flying Cloud Airport decreases to approximately 0.85 square miles while the 65 DNL contour increases to approximately 0.37 square miles. However, the residential structures within the 60 DNL contour increases to two single family homes. The 65, 70 and 75 DNL contours cover 0.37, 0.18 and 0.05 square miles, respectively, with no residential structures in the contours. The 2025 noise contours are shown in Figure 4.

In summary, there will be a 2.3 percent decrease in the 60 DNL contour, however two single family homes are located in the contour. The area within the 65, 70 and 75 DNL contour remains relatively unchanged with no single family homes located in these contours. The decrease in the overall size of the 60 DNL contour can be attributed primarily to an 8.6 percent decrease in total aircraft operations from 2007 to 2025. The increase in single family homes located in the 60 DNL contour can be attributed to the extension of Runway 10R-28L, which locates the departure end of Runway 10R closer to residential areas immediately southwest of the airport.¹

B. AIRPORT SAFETY ZONES

The State of Minnesota Department of Transportation (Mn/DOT) has established model regulations to consider in controlling the type of development allowed off runway ends in order to prevent incompatible development. These guidelines can be used as a basis to establish zoning ordinances to protect areas around an airport. The states zoning areas overlay and extend beyond the RPZs. The most restrictive areas created by the Mn/DOT model regulations are State Safety Zones A and B. The recommended safety zones exist off each runway end and follow the approach zones out to the total length of the runway. The length of Safety Zone A is 2/3 of the total runway length; Safety Zone B is 1/3 of the total runway length and extends from Safety Zone A. There is also an area called Safety Zone C which is circular and typically follows the FAA's FAR Part 77 horizontal surface.

In general, within each of the respective safety zones, the State Model Zoning Ordinance outlines the following land use restrictions:

- Safety Zone A does not allow any buildings or temporary structures, places of public assembly or transmission lines. Permitted uses include agriculture, livestock, cemeteries and auto parking areas.
- Safety Zone B does not allow places of public or semipublic assembly (i.e. churches, hospitals, schools) and is subject to site-to-building area ratios and site population limits. Permitted uses are generally the same as Zone A, plus some low-density developments.
- Safety Zone C does not allow use that causes interference with radio or electronic facilities on the airport or interference with radio or electronic communications between the airport and aircraft, lighting that makes it difficult for pilots to distinguish between airport lights and other lights or that results in glare in pilot's eyes, and lighting that impairs visibility in the airport vicinity.

¹ The noise contours for the preferred alternative, which includes the extension of the crosswind runway to the north, contain the same number of square miles as the contours previously provided for the crosswind runway shift alternative. There are areas of slight contour boundary variations between the respective contours, which are all located over non-sensitive land uses.

Mn/DOT prefers that airports own all of State Zone A. For land within the area that is not airport-owned, land use protection is recommended by including the safety zones in local zoning codes and zoning maps. Inclusion of the safety zones on community Comprehensive Plans is also strongly encouraged.

State Model Runway Safety Zones and Existing Land Use Around FCM

The existing RPZs and State Model Safety Zones A and B for Runways 10R-28L, 10L-28R, and 18-36 at Flying Cloud Airport are depicted in Figure 5 with the existing land uses around the airport.

The Runway 10R RPZ encompasses 78.8 total acres; 77.8 acres are on airport property and 1.0 acres are undeveloped. State Zone A contains 83.1 total acres; 81.2 acres are airport property and 1.9 acres are undeveloped. State Zone B contains 59.1 total acres; 53.9 are on airport property and 5.2 are undeveloped.

The Runway 10L RPZ encompasses 13.8 total acres on airport property. State Zone A contains 53.1 total acres; 52.7 acres are airport property and 0.4 acres are undeveloped. State Zone B contains 44.0 total acres; 29.4 acres are airport property, 11.9 acres are undeveloped and 2.7 acres are institutional.

The Runway 28R RPZ encompasses 13.8 total acres on airport property. State Zone A contains 53.0 total acres; 50.1 acres are airport property, 2.3 acres are undeveloped and 0.6 acres are industrial/utility. State Zone B contains 44.0 total acres; 20.6 acres are airport property, 18.2 acres are single family residential, 2.7 acres are undeveloped and 2.5 acres are park. There are 33 single family residential structures located in State Zone B.

The Runway 28L RPZ encompasses 13.8 total acres; 12.9 acres on airport property and 0.9 acres are undeveloped. State Zone A contains 83.1 total acres; 70.1 acres are airport property, 10.4 acres are industrial/utility and 2.6 acres are undeveloped. State Zone B contains 59.1 total acres; 26.7 acres on airport property, 12.4 acres are single family residential, 9.5 acres are undeveloped, 8.3 are industrial/utility and 2.2 acres are park. There are 51 single family residential structures located in State Zone B.

The Runway 36 RPZ encompasses 8.0 total acres; 6.1 acres are on airport property, 1.3 acres are park and 0.6 acres are undeveloped. State Zone A contains 31.7 total acres; 20.3 acres are park, 9.9 acres are on airport property, 1.0 acres are undeveloped and 0.5 acres are industrial/utility. State Zone B contains 24.1 total acres; 19.1 are water and 5.0 acres are park.

The Runway 18 RPZ encompasses 8.0 total acres; 7.7 acres are on airport property and 0.3 acres are park. State Zone A contains 31.6 total acres; 21.4 acres are airport property, 5.2 acres are water, and 5.0 acres are park. State Zone B contains 24.1 total acres, all of which are water.

State Model Runway Safety Zones and Forecasted Land Use Around FCM

The "Option 2" RPZs and State Model Safety Zones A and B for Runways 10R-28L, 10L-28R, and 18-36 at Flying Cloud Airport are depicted in Figure 6 with existing land uses around the airport.²

The Runway 10R RPZ encompasses 78.8 total acres; 63.6 acres are on airport property and 15.2 acres are undeveloped. State Zone A contains 83.1 total acres; 64.5 acres are airport property and 18.6 acres are undeveloped. State Zone B contains 59.0 total acres; 42.6 acres are undeveloped, 14.0 acres are agricultural, 2.4 acres are on airport property and less than 0.1 acres are institutional.

The Runway 10L RPZ encompasses 13.8 total acres on airport property. State Zone A contains 53.0 total acres; 52.0 acres are airport property and 1.0 acres are undeveloped. State Zone B contains 44.0 total acres; 25.4 are undeveloped, 11.6 acres are agricultural, 4.0 acres are airport property and 3.0 acres are institutional. There are 28 single family residential structures located in State Zone B.

The Runway 28R RPZ encompasses 13.8 total acres on airport property. State Zone A contains 53.0 total acres; 50.1 acres are airport property, 2.3 acres are undeveloped and 0.6 acres are industrial/utility. State Zone B contains 44.0 total acres; 18.1 acres are single family residential, 16.4 acres are airport property, 6.8 acres are undeveloped and 2.7 acres are park. There are 110 single family residential structures located in State Zone B.

The Runway 28L RPZ encompasses 13.8 total acres; 12.7 acres on airport property and 1.1 acres are undeveloped. State Zone A contains 83.1 total acres; 61.2 acres are airport property, 17.8 acres are industrial/utility and 4.1 acres are undeveloped. State Zone B contains 59.1 total acres; 20.8 acres on airport property, 15.3 acres are undeveloped, 12.4 acres are single family residential, 8.3 are industrial/utility and 2.3 acres are park. There are 49 single family residential structures located in State Zone B.

The Runway 36 RPZ encompasses 8.0 total acres; 6.8 acres are on airport property, and 1.2 acres are park. State Zone A contains 33.1 total acres; 21.2 acres are park, 10.7 acres are on airport property, 1.1 acres are undeveloped and 0.5 acres are industrial/utility. State Zone B contains 25.7 total acres; 20.9 are water and 4.8 acres are park.

The Runway 18 RPZ encompasses 8.0 total acres; 5.2 acres are park and 2.8 acres are on airport property. State Zone A contains 33.1 total acres; 16.9 acres are park, 13.1 acres are water, 2.3 acres are airport property, and 0.8 acres are single family residential. State Zone B contains 25.7 total acres, all of which are water.

The total residential units in the RPZs and State A and B Zones with "Option 2" Alternative are 0, 17 and 187, respectively. The increase of 103 total residential units in the State B Zone from the existing airport layout is a function of the Runway 10R-28L extension to 5,000

² The safety zones for the preferred alternative, which includes the extension of the crosswind runway to the north, results in slightly larger safety zones on both ends of the crosswind runway and a northerly shift of the safety zones on the north side of the crosswind runway (approximately 167 feet) as compared to the previously provided safety zones for the crosswind runway shift alternative. There is no additional land use impacts beyond that previously presented because the changes occur largely over water.

feet that will be completed in 2009; it is not a result of the Runway 18-36 options outlined in the LTCP.

Additional analysis was conducted relative to the planned 2020 land uses around Flying Cloud Airport as provided by the Metropolitan Council. Substantive proposed changes in land use are planned in the State Zones off of each end of runways 10L-28R and 10R-28L. Undeveloped land in State Zone B of runway 10R is planned to change to single family residential while undeveloped land in State Zone B off of runway 10L changes to institutional land use. In State Zones A and B of runways 28L and 28R, undeveloped land is slated to change to industrial, single family residential, right of way, and park land use. Minor changes in Zone A of runway 36 include the conversion of undeveloped land into right of way, industrial and park land uses.

C. JOINT AIRPORT ZONING BOARD (JAZB)

In July 2009 the MAC convened the Joint Airport Zoning Board (JAZB) which included the respective Responsible Governmental Units (RGUs) that control land use development around the Flying Cloud Airport. This effort will address land uses around Flying Cloud Airport in the context of the recommended alternative runway zones and may result in modification to the State Model Safety Zone dimensions and development restrictions. The airport zoning process is spelled out in detail in Minn. Stat. Chap. 360, 360.061 – 360.074 and Minn. Rules Chap. 8800.1200 and 8800.2400. Specifically, Minn. Stat. § 360.062 establishes that “airport hazards” endanger lives, property and airport utility and should be prevented, with consideration given to avoiding the disruption of existing land uses based on social and financial costs. In an effort to prevent the creation or establishment of “airport hazards,” the statute states that “the Metropolitan Airports Commission shall request creation of one joint airport zoning board for each airport operated under its authority.” The statute states that “A joint board shall have as members two representatives appointed by the municipality owning or controlling the airport and two from the county or municipality, or in case more than one county or municipality is involved two from each county or municipality, in which the airport hazard is located, and in addition a chair elected by a majority of the members so appointed.”

The goal of the JAZB will be to develop a Flying Cloud Airport Zoning Ordinance for review and approval by the Commissioner of Transportation, for subsequent adoption by the Board and then by local municipalities. The Board will determine if the state model zoning ordinance provisions are appropriate for the Flying Cloud Airport or if modifications to the model are necessary considering the provisions of Minn. Stat. §360.066, subd. 1. The focus of this discussion is likely to be on the following:

- Mn/DOT Model Ordinance – Minnesota Rule 8800.2100 and Minnesota Rule 8800.2400 (additional information on the Mn/DOT Model Zoning Ordinance is available on the Internet at <http://www.dot.state.mn.us/aero/avoffice/planning/zoning.html>)
- Flying Cloud Airport unique characteristics in the context of existing and planned land uses around the airport
- Maintaining a “reasonable standard of safety” while considering the social and financial costs to the community
- Minn. Stat. §360.066, subd. 1, which is especially instructive when addressing the question of balancing the safety with the social and economic impacts in the zoning process.

V. PUBLIC INVOLVEMENT PROCESS

The public involvement process for the Flying Cloud LTCP update has included numerous meetings, as shown in the table below. In addition to the meetings, MAC also corresponded regularly with the LTCP Technical Advisory Group, which includes representatives from the FAA, Metropolitan Council, Mn/DOT Aeronautics, the MAC Airport Manager, MAC Environment, and MAC Airport Development.

Upon MAC Commission approval of the recommendations, staff will complete the LTCP Update draft. The draft will be made available for a 30-day public written comment period. This is anticipated between the months of October and December 2009. Once written comments are received, MAC will include them in the document, and present it to the MAC Commission requesting the authority to submit it to the Metropolitan Council for their review.

Meeting with:	Date:
Eden Prairie City Planners	February 17, 2009
Airport FBOs	March 3, 2009
Airport Tenants	March 3, 2009
Reliever Airport Advisory Committee (RAAC)	April 29, 2009
Flying Cloud Airport Advisory Commission (FCAAC)	March 12, 2009
MAC FD&E Committee Meeting	May 6, 2009
MAC M&O Committee Meeting	May 6, 2009
Flying Cloud Airport Advisory Commission	May 14, 2009
Flying Cloud Airport Advisory Commission – Public Meeting	May 28, 2009
LTCP Public Informational Meeting	June 18, 2009
MAC FD&E Committee	July 8, 2009
MAC FD&E Committee-Revised Preferred Alternative	September 9, 2009
Flying Cloud Airport Advisory Commission	September 10, 2009
LTCP Public Written Comment Period	30 days after revised draft is complete

To date, MAC has requested informal written or verbal comments regarding the LTCP Update. Two verbal and one written comment has been received supporting the shortening of Runway 36. Two verbal comments have been received asking that no runway length be lost. Airport users, businesses and the public will have another opportunity to offer opinions during the written comment period as noted above.

VI. PLAN RECOMMENDATIONS

As noted in Section III, Runway 36 currently has a non-compliant runway safety area (RSA) and non-compliant object free area (OFA). Two options were reviewed to correct the deficiency.

Based on the analysis of the three alternatives discussed in Section III, MAC staff recommends Runway 18-36 be shifted north and lengthened to 2,800 feet to create a compliant RSA and OFA and better serve aircraft using the runway especially during critical cross-wind operations. The FAA will likely not provide federal funding for projects associated with Runway 18-36 unless a compliant runway safety and object free areas are achieved.

We also recommend that the north perimeter road be constructed as a part of the Runway 18-36 improvements.

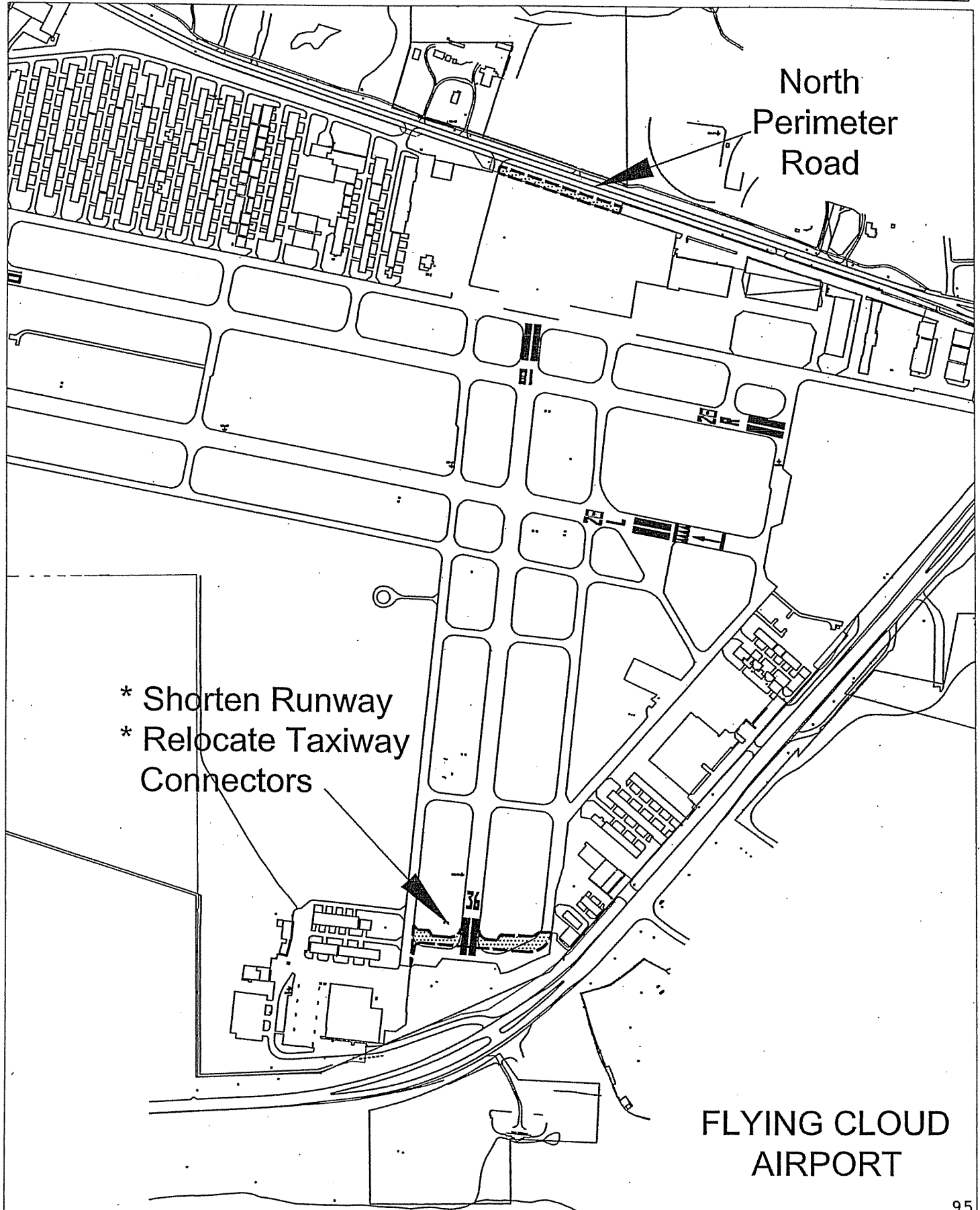
Other recommendations for the LTCP Update include:

1. Continue pavement reconstruction and rehabilitation as a part of the on-going pavement maintenance program, including reconstruction of the south end of Runway 18-36, which is currently shown in the approved CIP for 2010.
2. Taxiway Alpha object free area clearance. Some of the 1950's vintage hangars along the north side of Taxiway A actually lie within the taxiway object free area. MAC recommends continuing to work with these tenants over time as they plan on hangar redevelopment to eliminate obstructions to the taxiway.
3. Obstruction removal for the approach area to Runway 18. There are trees in the runway protection zone that need to be removed. MAC is in the process of quantifying the number of obstructions, and locating them on MAC and City park property.
4. Continue discussion with the FAA relative to the ultimate relocation of the Air Traffic Control Tower to a location in the new south hangar area.
5. Continue research and development of non-aeronautical land uses on airport property not needed for aviation use.
6. Continue cooperation with the City of Eden Prairie through the existing MAC/City agreements, the Flying Cloud Airport Advisory Commission, and on-going MAC/City staff interaction.

SHORTEN RUNWAY 18/36

58' On South End - Runway Length Becomes 2,633'

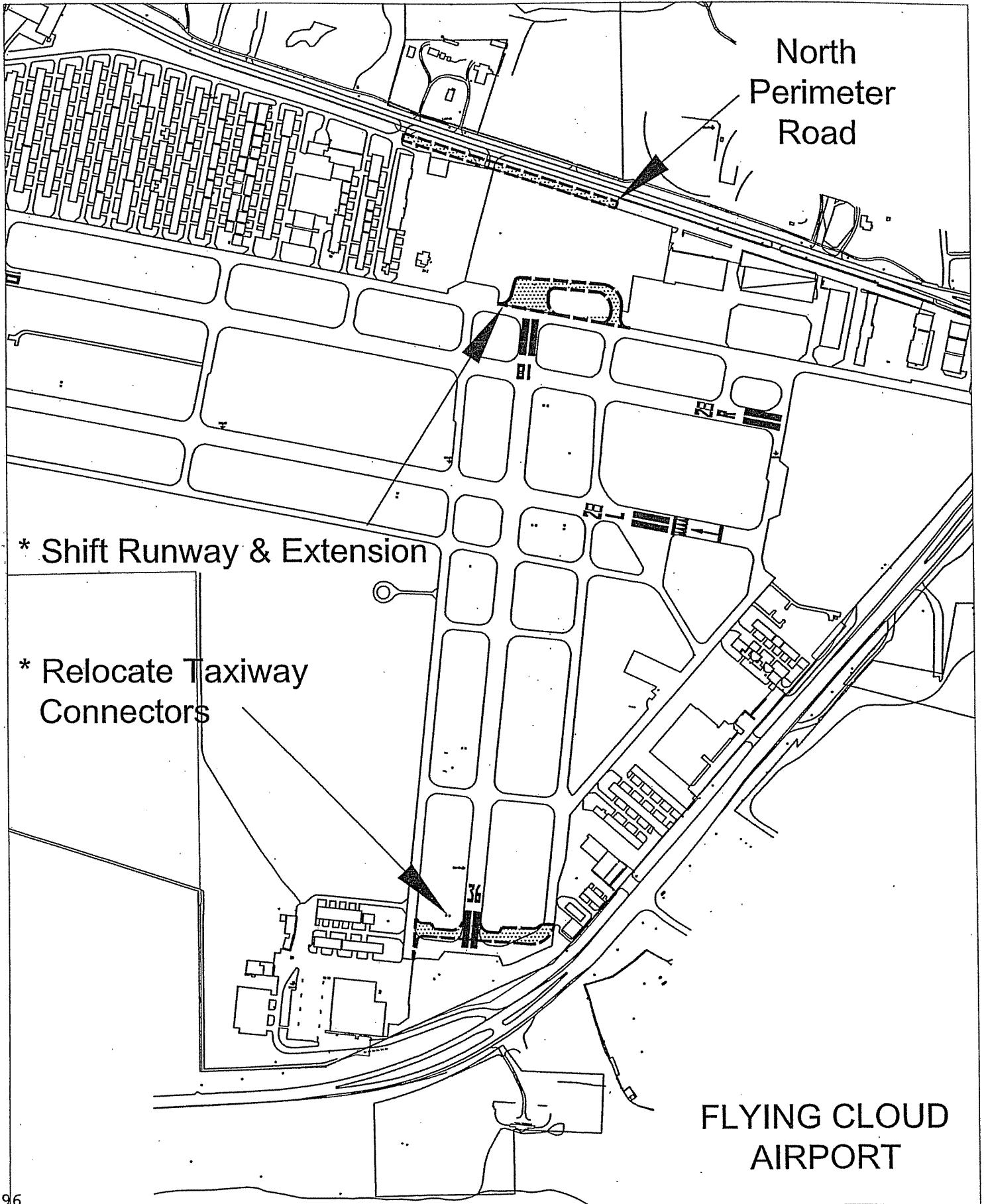
Figure 1



SHIFT AND EXTEND RUNWAY 18/36

58' Shift / 109' Extension - Runway Length = 2,800'

Figure 2



* Shift Runway & Extension

* Relocate Taxiway Connectors

North
Perimeter
Road

FLYING CLOUD
AIRPORT

Figure 3

2007 Baseline Contours

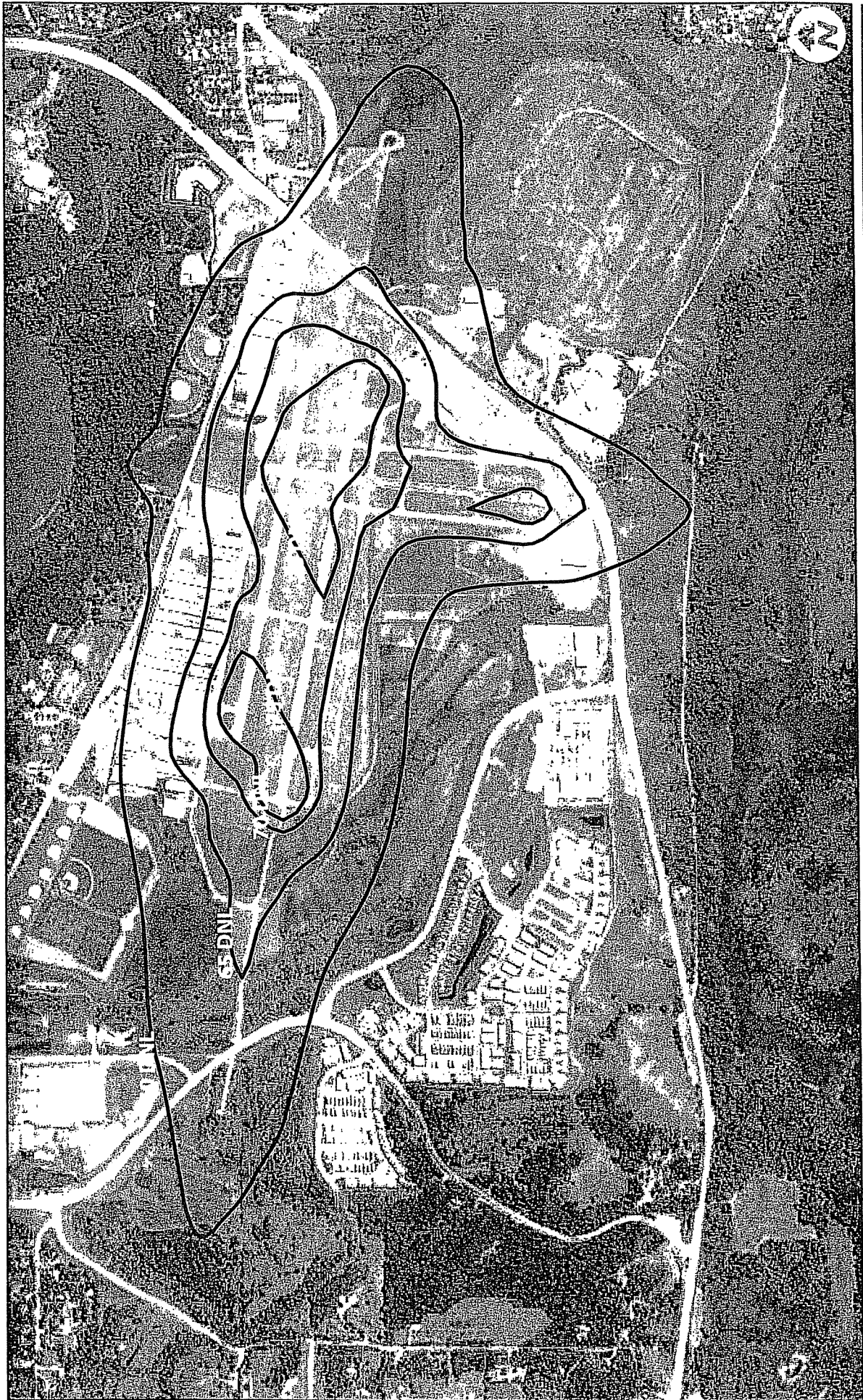
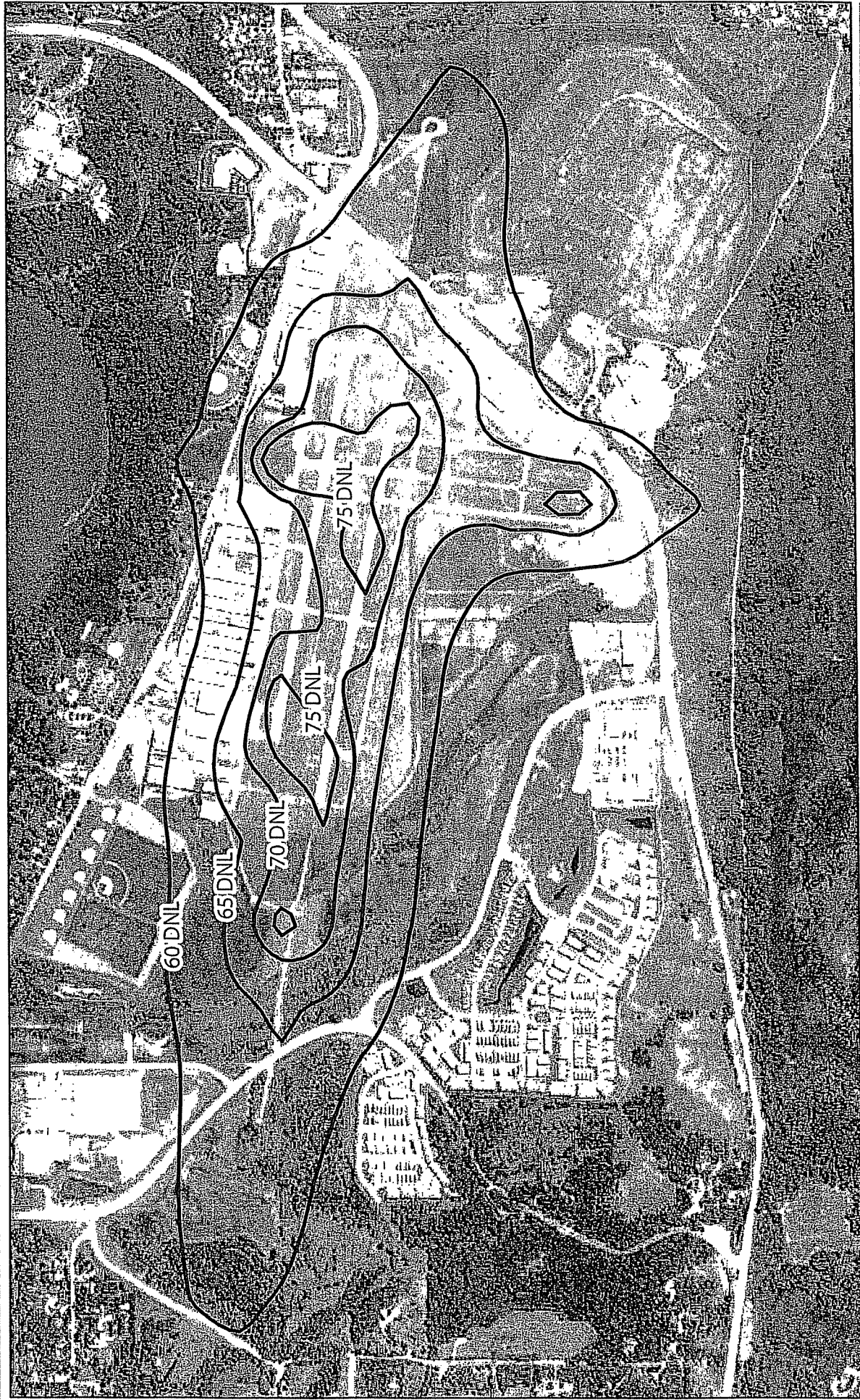
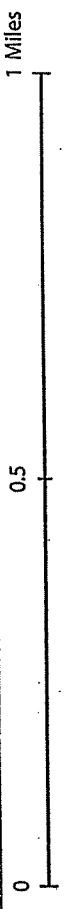


Figure
4

Forecast 2025 Noise Contours

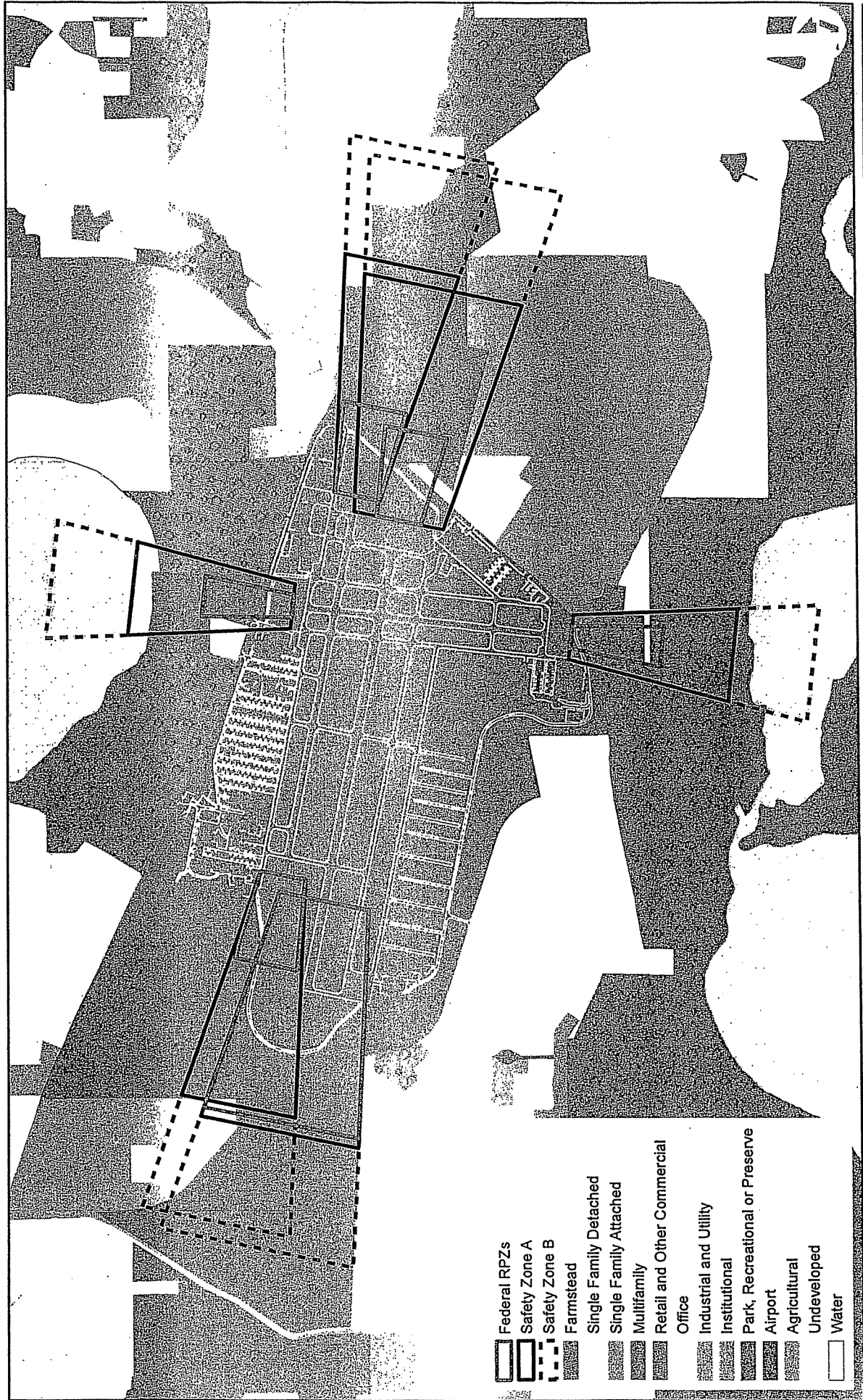


Flying Cloud Airport (FCM)



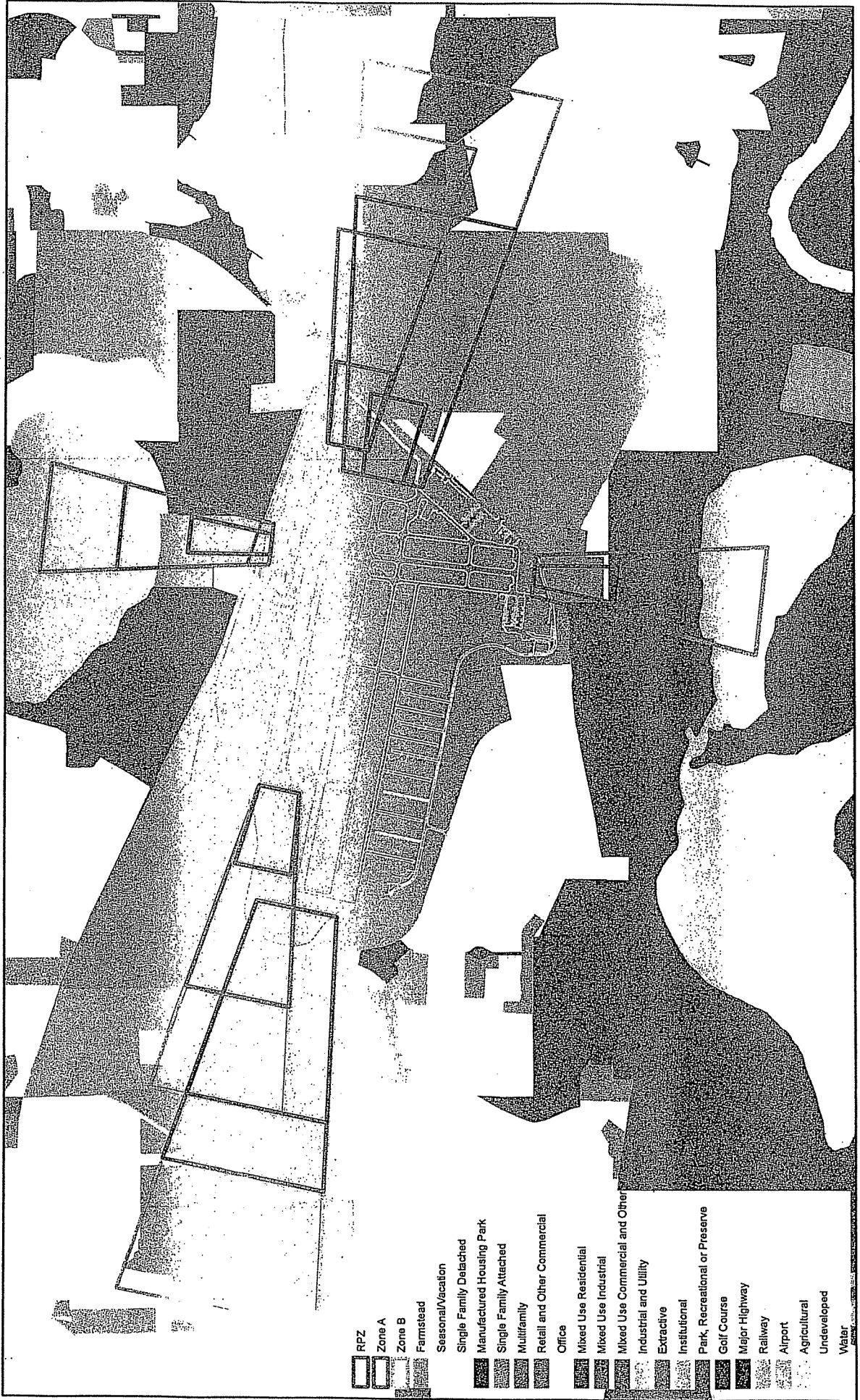
2007 RPZs and State Zones with 2005 Land Use

Figure 5



"Option 2" RPZs and State Model Zones With 2005 Land Use

Figure
6



Flying Cloud Airport (FCM)

