[MS-0398.030.015.002]

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November 11, 1989

Mr. Michael Zdon
Technical Advisory Committee for Aviation
San Diego Association of Governments
Suite 800, First Interstate Plaza
401 B Street
San Diego, California 92101

Dear Mr. Zdon:

I hereby request that the SANDAG Airport Consultant evaluate my plan, described in detail below, for combined airline and military use of Miramar Naval Air Station.

With the addition of suitable facilities, Miramar is the best place to put airline operations considering all of the other reasonable options. It is centrally located and is the only site where aircraft noise already exists and local residents have learned to tolerate it. The addition of the quieter commercial aircraft would cause only a small noise addition increment. With proper design of the controlled airspace noise levels could actually decrease at ranges more than a mile from the field. The Navy can remain where they are and their operations are largely unaffected. With intelligent thinking, it is possible to devise a plan where military and commercial operations coexist on the same field almost independently.

The plan, which I have been studying for over two years, is described in the pages below. It is very flexible and can easily meet the reasonable needs of both the military and the airlines. It readily satisfies all of the technical issues regarding aircraft compatibility, safety, and noise. The addition of new runways, the extension of existing ones, and other new facilities constructed at Miramar would permit largely independent operations. In particular, the Navy's missions would not be compromised in any way and, because some facilities can be shared, may even be enhanced. In my opinion this is the best solution to the airport problem in San Diego. It will even allow the summer air shows to continue. Its implementation only requires the willingness of the participants.

The last is perhaps the hardest to achieve. Yet, in my opinion, it is in the long-term interest of the military to cooperate because it would allow them to pursue their activities at Miramar indefinitely: the pressure to move all military aviation out of San Diego proper would diminish.

Closure of Lindbergh Field

As part of my plan, Lindbergh Field would be closed and about 125 acres of the land would be given to the military to expand their training facilities. This gift is in return for the cooperation of the

military for the move to Miramar. The rest of the land would be used to either help finance the move or, with development, replace the lost income for the Port District. To retain the site as a downtown airport I believe would be underutilizing that valuable land and would be unsatisfying to those nearby residents who have fought for so long for some peace and quiet.

Ground Rules

The ground rules chosen were such as to maximize the probability of implementing the plan. They relate to the Navy's mission, economics, environmental issues, ground traffic, and impact on surrounding populations. They are given below:

- Minimize disruption of Navy missions including during construction.
- Permit Navy touch-and-go operations at least for proficiency maintenance but probably moving initial carrier training to a more remote location.
- Assure that the Navy always has at least one runway reserved for no-delay arrivals.
- Minimize overflights of residential areas, even during Santa Ana conditions.
- Minimize noise footprints to nearby residential areas.
- Minimize highway traffic disruptions during construction.
- Minimize environmental disruptions. In particular, avoid filling of San Clemente Canyon.
- Minimize disruption of nearby operations like the west landfill and the Harris Sand and Gravel Company.
- Have at least two vehicle entrances with at least one from SR 52.
- Minimize disruptions to Montgomery Field traffic to restrictions or elimination of right-hand traffic.
- Minimize construction costs.
- Maximize separation between civilian and military ground facilities.

These ground rules generally limit the boundary of the plan to the existing Miramar area bounded by Interstates 15 and 805, State Route 52 and Miramar Road. I believe that all the objectives can be met while staying within this boundary.

Parallel Use

The basis behind the plan is that of "parallel" use of facilities, a term that is less ambiguous than "joint" or "shared" use. Parallel use means that military and commercial aircraft operate in parallel with minimum overlap. They generally use different runways and taxiways and occupy different airspace. In this plan, two runways are reserved for use by the military: one for arrivals and departures and one for carrier touch-and-goes. A third runway is reserved for the airlines. There are five runways in all, permitting separate arrival and departure runways for the military and the airlines. Each user has their own instrument approach.

Description of the Figures

Two figures are attached to this letter. The first shows the ground surface plan and the second shows the Terminal Control Area (TCA). No proposal of this sort would be complete without the latter.

The surface plan shows runways, taxiways, ground access, parking, terminal area, industrial area, and a planted forest for noise absorption. Also shown in tables are runway dimensions and suggested runway usage. It is drawn on a 13-year old USGS topographic map, the latest available. Although it was necessary to sketch in Route 52, an advantage of using such an old map is that the original, rather than filled, contours are visible. This provides important subgrade information for runway placement.

The TCA was drawn on a pre-TCA aviation sectional chart to avoid having to white-out the existing TCA. With the exception of Route 52 and Interstate 15, all essential features appear on this chart. The "fractions" in each sector show the floors and ceiling (12,500 feet above sea level) of the controlled airspace in hundreds of feet. Scale is 8 statute miles/inch.

The tables in the figures describe runway usage and traffic patterns in condensed form. They are elaborated upon in the discussion below.

Runway Use and Traffic Patterns

There are a total of five runways. The military and the airlines each have their own runway with Instrument Landing System for their exclusive use. The military also has preferential use of a runway for carrier practice. The other two runways would have mixed use depending on demand and weather.

Military and airline traffic patterns are fully separated. The military would generally stay to the north of the field and use right-hand traffic. The exception is the carrier practice, which would use a tight, non-interfering left-hand pattern. Commercial traffic generally would stay to the south of the field and use left-hand traffic. Westbound departures must be sequenced, of course, but this can be minimized by fanning departures over a 20-30 degree departure

arc and exploiting the vertical separation that will arise naturally from the different aircraft climb angles.

Military Arrivals and Departures

The military operations would remain essentially as they are, with runway 24R being the primary runway. Formation approaches over the field followed by left traffic should be possible perhaps with downwind legs higher and extended until the runway 26R centerline has been crossed. Note that formation approaches would be difficult if the commercial runway were parallel rather than diverging. Because of the modified TCA, the 2000' Seawolf departure can be modified to permit higher altitudes crossing the coastline, greatly reducing the noise footprint in the Sorrento Valley and Torrey Pines area.

The extended runway 28 could also be preferentially used for military departures, eliminating the sharp turns now needed to avoid east University City, and also lowering the noise footprint in that area. Even though this runway crosses 24R, it would be easy to sequence with military arrivals on that runway.

Military Carrier Practice

The carrier practice runway, 26L, would be built partly on the old east landfill and partly on the undisturbed land between it and the west landfill. As seen on the map, only two small finger canyons project under the runway. Therefore, once the required small area of landfill is removed, the runway will be mainly on a firm foundation. This runway is somewhat removed from other runways by the two taxiways. It would be used primarily for proficiency maintenance by advanced pilots. Initial carrier training would be at a remote location such as San Clemente Island.

Considering that the existing left-hand pattern using 24L takes traffic just about over San Clemente Canyon, traffic using 26L should be able to stay north of Route 52. The typical bank angle to make that turn would be less than 30°. The right-hand traffic at Montgomery Field to the south can stay 1/2 mile south of Clairemont Mesa Blvd., so there is about one mile horizontal separation. Although not required, a 500' vertical separation of downwind legs could also be established. If necessary, the Montgomery right-hand traffic could be restricted to when carrier touch-and-goes are ~~in~~ NOT being performed.

When there is no carrier practice, runway 26L could also serve for commuter aircraft departures and visual approaches; and runway 8R could occasionally serve for departures during Santa Ana conditions.

This runway should be able to accommodate the existing level of carrier practice. It could be eliminated from the plan if carrier practice were moved to other locations.

Normal Commercial Operations

The main commercial runway would be 26R-8L. It would have an ILS, as would runway 24R. Runway divergence is such that aircraft on the two ILS's are well separated all the way to touchdown. Commercial aircraft on the runway 26R ILS would pass well above and about one mile north of 1260' Fortuna Peak east of the field. A 3.5^{o} glideslope could be used all the way from Mt. Laguna.

Departures from runway 26R would typically make a 20° right turn after liftoff and head straight for the coastline. This track would take airliners over commercially-zoned areas only. Residential areas would be at least one-mile from the flight path. With the unrestricted climbout afforded by the TCA, most aircraft would be above 3000' by the coastline, with the resultant low noise footprint.

With 12000' length and no obstructions to the east, runway 8L could be used for the numerous eastbound morning departures when the wind is essentially calm. By departing straight out, the time an aircraft spends in the busy traffic area is more than halved.

This runway would be just north of the landfill area, so no special construction would be required. The Harris Sand and Gravel operation would be unaffected, and no filling of the canyon would be needed.

Other Runways

The existing runway 28 would be extended northwest to 9300'. This could be the overflow runway for both military and commercial departures during peak periods. It could also serve as the main military departure runway, eliminating the need for sharp turns during climbout. A taxiway would be built to allow commercial aircraft to reach this runway without being trapped behind runway 26R departures. There would be no landings on runway 28 but runway 10 could be used for military arrivals during Santa Ana conditions.

Runway 24L would also be for mixed use, mainly visual approaches during peak periods. It would be extended to 9100'. The current carrier practice activities on this runway would be moved to runway 26L.

Typical Use Of Runways

Under VFR conditions typical use of runways might be as follows: Military arrivals would be on runway 24R and departures on 24R and 28. Carrier practice would be on runway 26L. Commercial arrivals would be on runways 24L and 26R, and departures on 26R, 8L, and 28. Controllers would always have enough flexibility to match runways to demand and conditions.

While military and airline operations are largely on separate runways, during peak periods there could be some spillover, and taxiways allow for this. For example, the airlines might have use of all runways during the peak 0700-0900 and 1600-1800 periods while the Navy might have them during their peak periods.

Airline Terminal and Other Ground Facilities

There is ample room west of the field for terminals, parking, and industry. I have illustrated this in the Surface Plan by copying over the Lindbergh Field East Terminal four times from another topographic map with the same scale. The parking area of about 160 acres is at least four times the area available at Lindbergh. I have also copied over the General Dynamics, Ryan, and other industrial facilities to show the room available for industrial activities that need direct access to the runways. The military, airline, and industrial activities can be performed on this site without interference.

The airline terminal is placed well removed from military facilities and also in such a way that arriving aircraft have minimum taxi distance to the gates. While aircraft departing westbound have a long taxi distance, this allows time to complete preflight checklists.

The Forest

The planted eucalyptus forest is an aesthetic and inexpensive way of softening the noise impact. It would be especially effective during thermal inversions when the sound hugs the ground and is the most annoying. These trees are fast-growing and have succeeded in Scripps Ranch and UCSD. I estimate about 100,000 trees would be required. At, for example, $100 per installed tree including irrigation (if any), the cost would be about $10 million. Considering that the entire facility cost could easily run $500 million in direct costs, that is a small price for being neighborly.

Terminal Control Area

An advantage of using the Miramar site is that the terminal control area can be made much simpler that the existing one, something not possible with other proposed sites. The enclosed TCA is more restrictive to uncleared aircraft west of the field than the existing one but otherwise is about the same north of Mission Valley. There is no TCA south of Mission Valley.

The TCA is designed for unrestricted climbout for westbound departures. Military and airline approach patterns are fully separated. It has two final approach paths from the east: one coming in from Julian for the military and one from Mt. Laguna for the airlines. Military arrivals from the west would use right-hand traffic north of Mira Mesa and commercial arrivals would use left-hand traffic down Mission valley. The TCA floor drops at about Lake Murray to allow for descending left turns.

The TCA boundaries are straight line segments tied where possible to ground features or navaids. Such boundaries are easy to find by excluded general aviation pilots. Montgomery Field traffic along the coastline would have to stay below 1800' or move six miles offshore to go to 2800'. A convention could be instituted where northbound departures from Montgomery hug the coastline while arrivals stay a mile or so offshore. This would still be within gliding distance to land. The notch shape in the TCA just north of Miramar Field is to allow for the hot-air balloon activities originating near Del Mar Race Track.

Noise and Safety Issues

This is the only site where the noise level is already substantial and nearby residents have learned to tolerate it. Any other site would introduce noise where none has been before. This plan would increase noise levels a little in north Tierrasanta and east University City. Noise levels may actually drop slightly in Scripps Ranch and Mira Mesa because of the southward shift of the carrier practice pattern. In areas more than a mile from the field, noise levels should either stay about the same or reduce despite the greater traffic volume because of the effects of the eucalyptus forest and the more flexible TCA. Note that noise levels near the closed Lindbergh Field will drop to zero. Unlike Lindbergh, a total curfew will not be needed.

This plan separates commercial and military activities to the point where overlap is minimal and the issues of incompatibility no longer apply. In fact, the different performance envelopes will help increase aircraft separation during departures. The combined traffic density is still less than at Boston or St. Louis, and is much less than JFK or O'Hare. It is lower still if one excludes carrier practice, which does not affect other operations. Considering this, and considering that weather is usually benign and also that each operation has their own runways, delays are unlikely. In particular, military aircraft approaching with low fuel supplies will have as much runway access as they do now, and possibly more.

The level of safety that must be assured to civilians is the same whether they are in residences, shopping areas or commercial aircraft. The military operations at Miramar have so far been deemed safe enough for the first two. There are therefore safe enough for the last one as well. The Navy can't have it both ways: either their operations are safe enough for properly controlled commercial aircraft or they are not safe enough to be performed at Miramar at all, and therefore the entire military facility should be moved away from populated areas.

Air Shows

The popular summer afternoon air shows at Miramar could continue with some schedule modifications. The aerial exhibitions, including practice, occur over the 1200-1600 time period from Thursday through Sunday. Because these are low commercial traffic periods, delays can be minimized by introducing 20 minute intermissions of the show every hour and allowing commerical traffic use of all runways during those intervals. This is equivalent to using half the runways, the usual mode, for 40 minutes per hour.

Summary

In summary, parallel use of Miramar offers the best solution to the aviation problem in San Diego. The site is centally located and has excellent freeway access. The plan offered here can readily meet the rational needs of both the military and the airlines. There is also room for industrial activity. Compatibility, noise and safety issues are readily dealt with by (1) separating commercial and military activities both on the ground and in the air, (2) having more flexible controlled airspace so that departing aircraft are not constrained from reaching high altitude, and (3) by providing a noise-absorbing forest.

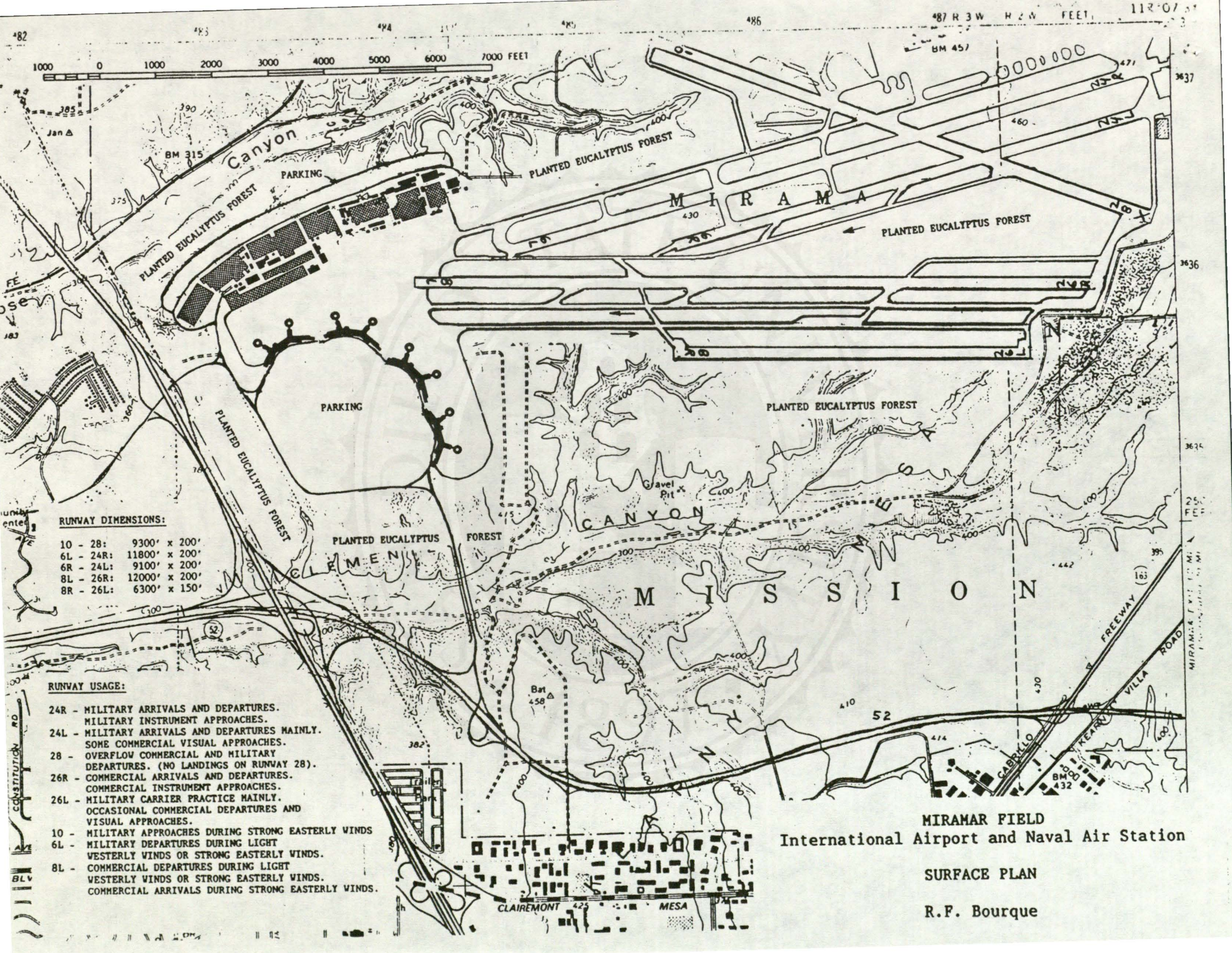
Two of the five runways are for military use only and one is for commercial use. The last is long enough to allow for many straight out eastbound departures. The remaining two runways can be shared, although one could be used as the primary military departure runway. Separate landing and takeoff runways are always available for the military and for the airlines. Runways, taxiways, and ground facilities are placed so that the environmental impact on virgin landscape is minimal. Finally, the plan appears to provide all of the capability required at minimum possible cost and minimum disruption during construction.

It is important that any plan be sufficiently superior to the existing situtation to justify the expense and inconvenience of making the move. The plan proposed above is clearly superior to any thus far proposed, and is so far superior to the existing situation as the justify the move from Lindbergh Field to Miramar Field.

Sincerely,

Robert F. Bourque, Ph.D.

enclosures



MIRAMAR FIELD
International Airport and Naval Air Station

SURFACE PLAN

R.F. Bourque

MILITARY TRAFFIC PATTERNS

Inbound from the West: Cross the coastline north of the field for right-hand traffic for runway 24L. Formation approach over runway 24L or 24R at or above 2500 MSL staying above 1800 MSL during downwind leg until east of I15.

Inbound from the East: Straight in along runway 24R localizer/ILS.

Carrier Training: Left-hand traffic using runway 26L remaining north of SR 52.

West and North Departures: Runway 24R turning to 280 heading after takeoff straight to the coastline crossing the coastline at or above 2500 MSL. Also runway 28 straight out.

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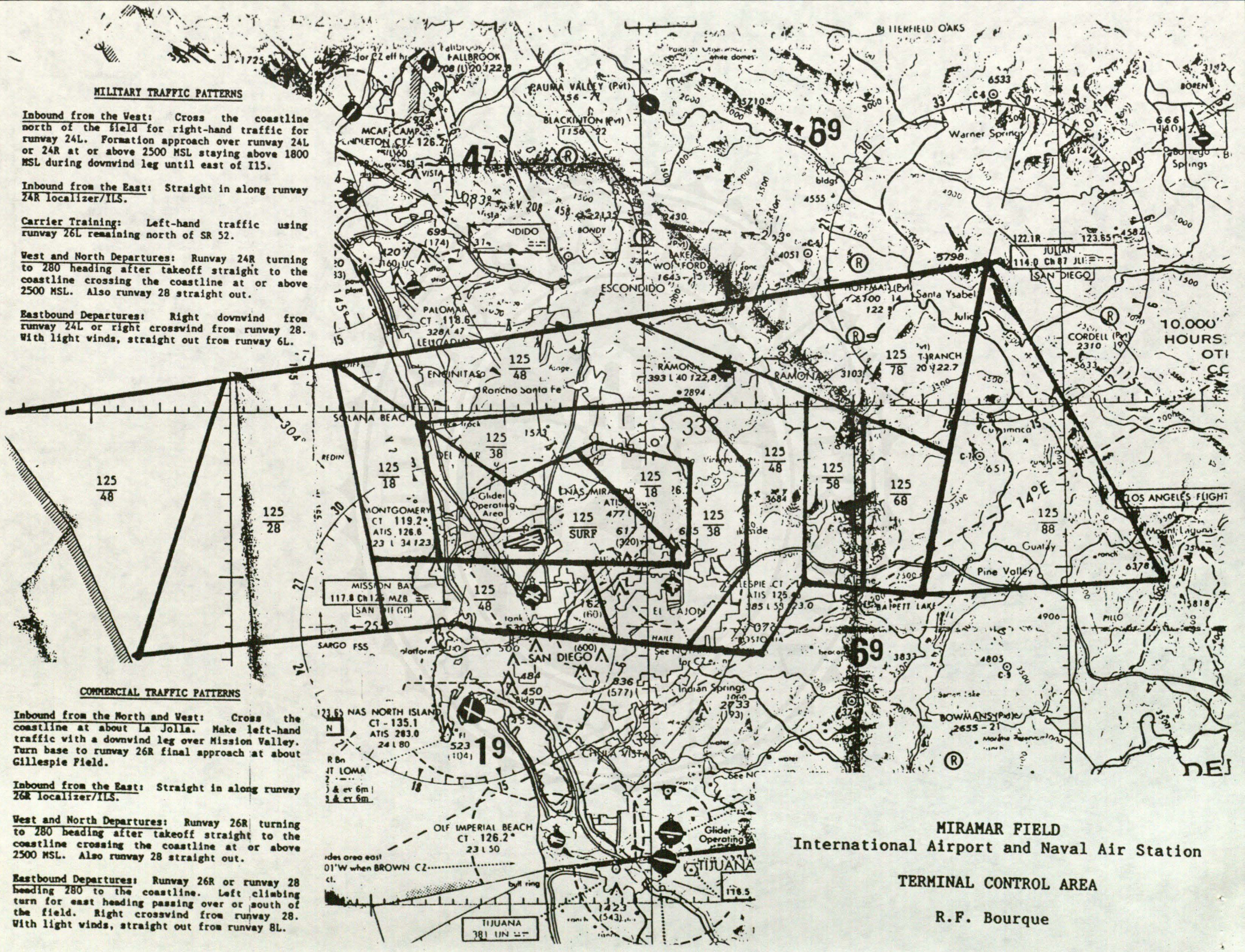

COMMERCIAL TRAFFIC PATTERNS

Inbound from the North and West: Cross the coastline at about La Jolla. Make left-hand traffic with a downwind leg over Mission Valley. Turn base to runway 26R final approach at about Gillespie Field.

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MIRAMAR FIELD
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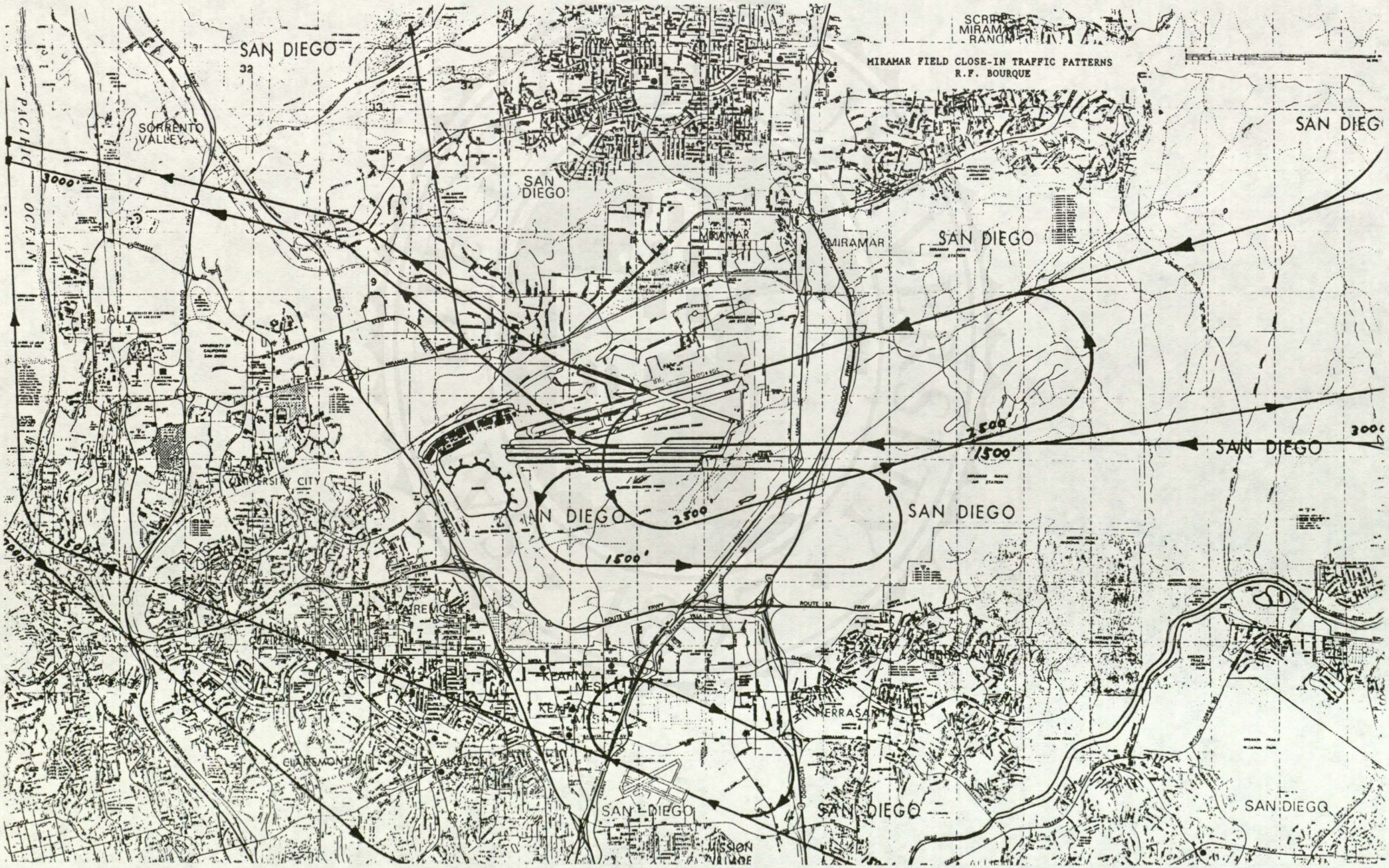
TERMINAL CONTROL AREA

R.F. Bourque


MIRAMAR FIELD CLOSE-IN TRAFFIC PATTERNS
R.F. BOURQUE
SAN DIEGO
SORRENTO VALLEY
PACIFIC OCEAN
LA JOLLA
UNIVERSITY CITY
CLAIREMONT
KEARNY MESA
TERRASANTA
MIRAMAR
SCRIPPS MIRAMAR RANCH
MISSION VILLAGE
3000'
2500
1500'

A PLAN FOR COMBINED USE OF MIRAMAR BY THE NAVY AND THE AIRLINES

Robert F. Bourque, Ph.D.
Professional Engineer

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San Diego, CA 92117
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Slide copies presented to SANDAG on December 13, 1989

INTRODUCTION

- With the addition of suitable facilities, Miramar is the best place to put airline operations considering all of the other reasonable options.

- It is centrally located and is the only site where aircraft noise already exists.

- The addition of the quieter commercial aircraft would cause only a small noise addition increment.

- With proper design of the site and the controlled airspace noise levels could actually decrease more than a mile from the field.

- The Navy can remain where they are and their operations are largely unaffected.

Introduction, cont.

- The proposed plan satisfies all of the technical issues regarding aircraft compatibility, safety, and noise.
- It permits largely independent operations under a common control.
- The Navy's missions are not compromised and, because some facilities can be shared, may even be enhanced.
- The retention of the buffer zones owned by the Navy would preclude pressure to develop those lands.
- It will even allow the summer air shows to continue.
- Its implementation only requires the willingness of the participants.

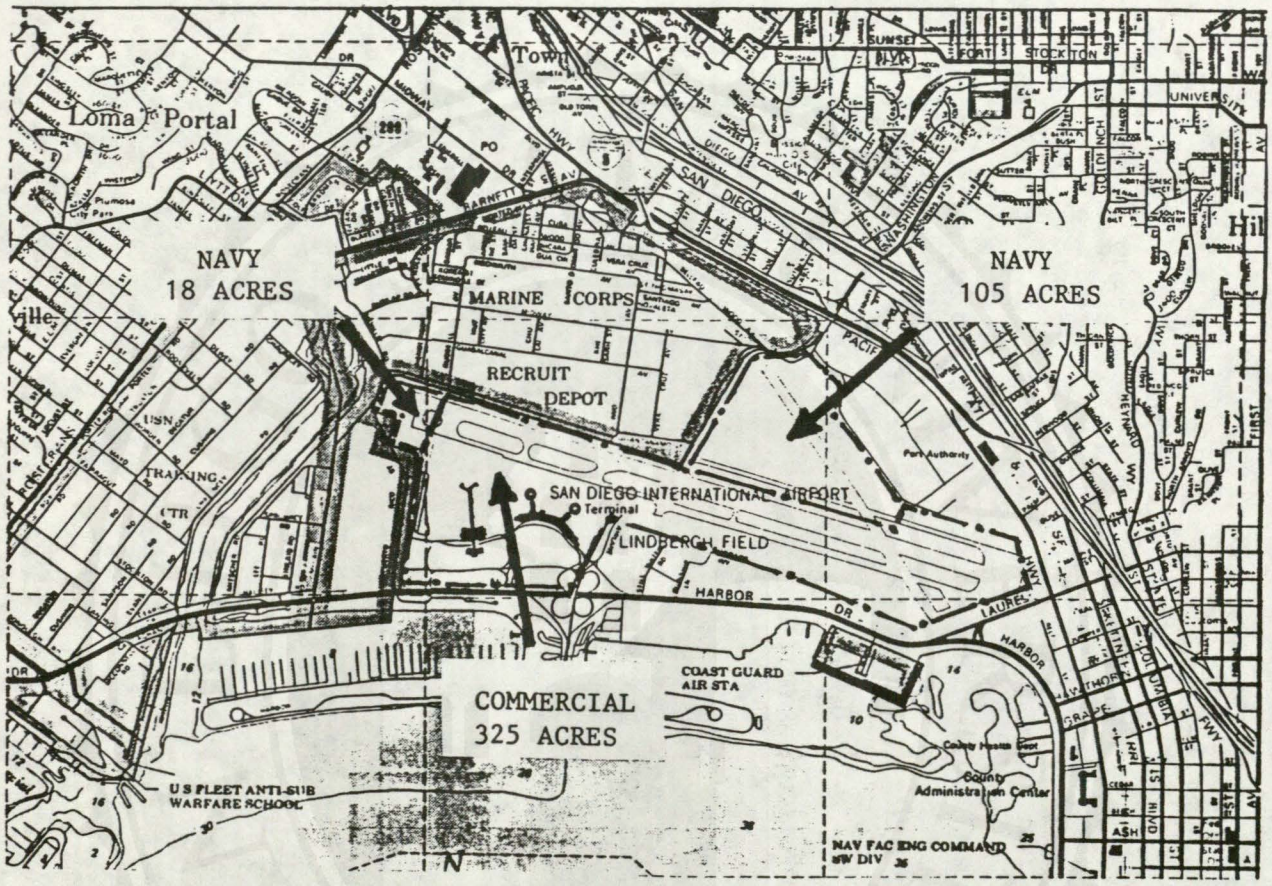
CLOSURE OF LINDBERGH FIELD

- Lindbergh Field should be closed and 100 - 150 acres of the land given to the military to expand their training facilities.

- This gift is in return for the cooperation of the military for the move to Miramar.

- The rest of the land can be used to either help finance the move or, with development, replace the lost income for the Port District.

- To retain the site as a downtown airport would be underutilizing that valuable land and unsatisfying to those nearby residents who have fought for so long for some peace and quiet.



Possible partitioning of Lindbergh Field land area after moving commercial facilities to Miramar.

PLAN OBJECTIVES

Objectives were chosen to maximize the probability of implementing the plan. They relate to the Navy's mission, economics, environmental issues, ground traffic, and impact on surrounding populations:

- Minimize disruption of Navy missions including during construction.
- Permit Navy touch-and-go operations at least for proficiency maintenance but probably moving initial student training to a more remote location.
- Assure that the Navy always has at least one runway reserved for no-delay arrivals.
- Minimize low altitude overflights of residential areas, even during Santa Ana conditions.

Objectives, cont.

- Minimize noise footprints to nearby residential areas.
- Minimize highway traffic disruptions during construction.
- Minimize environmental disruptions. In particular, avoid filling of San Clemente Canyon.
- Minimize disruption of major nearby operations like the west landfill and the Harris Sand and Gravel Company.
- Have at least two vehicle entrances with at least one from SR 52. If possible, avoid an I15 vehicle entrance.

Objectives, cont.

- Minimize disruptions to Montgomery Field traffic to restrictions on right-hand traffic.

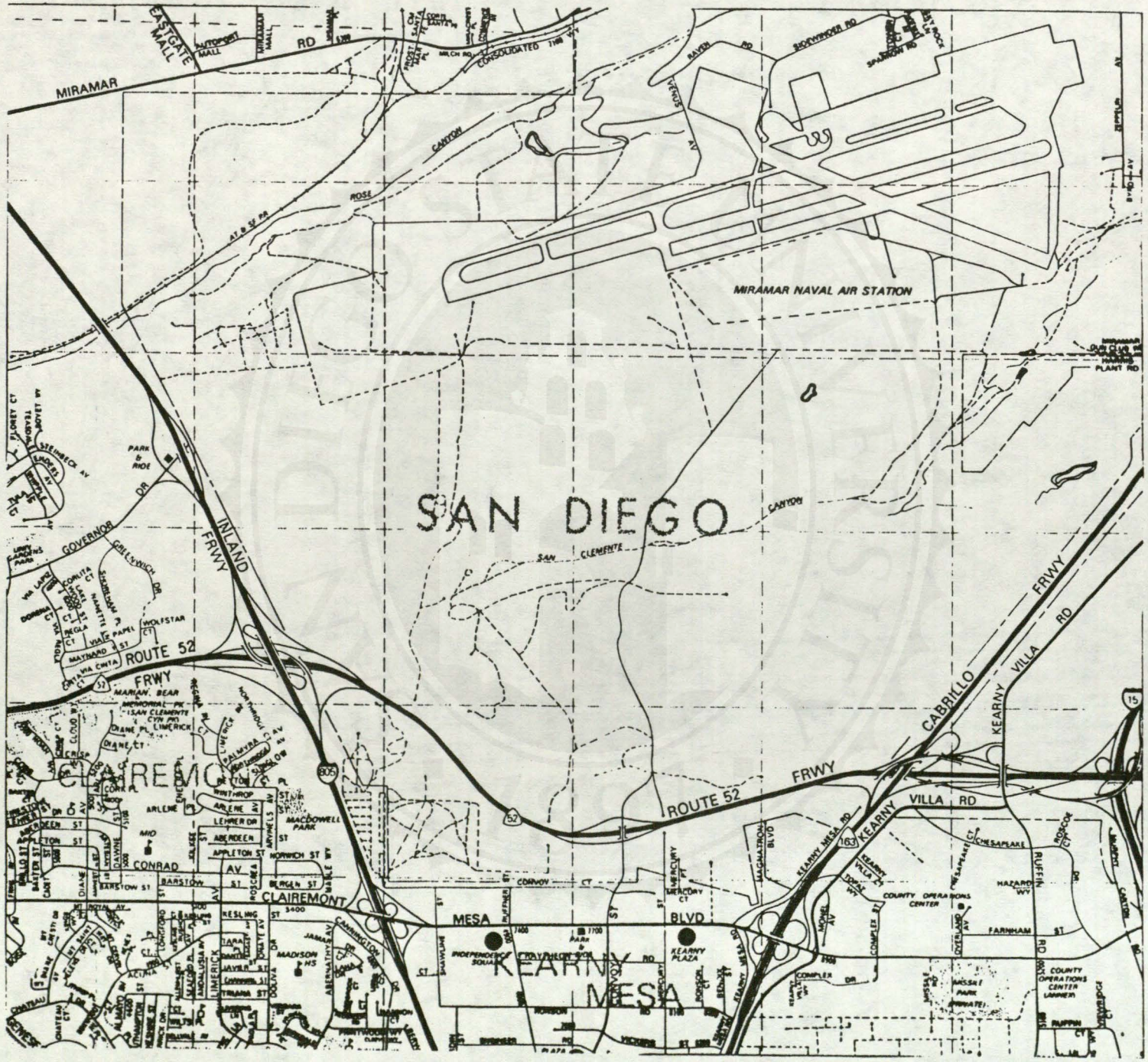
- Minimize construction costs.

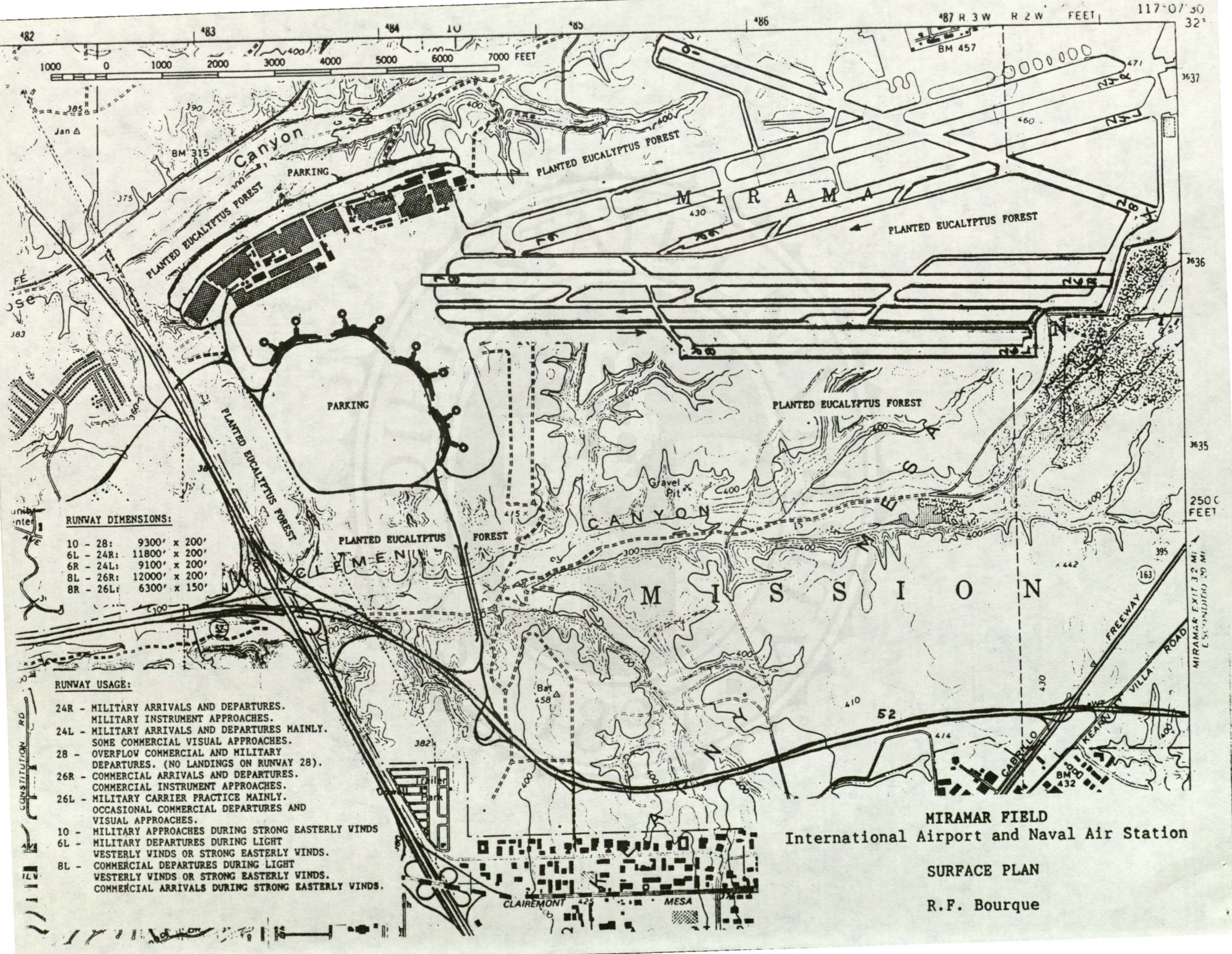
- Maximize separation between civilian and military ground facilities.

- Assure retention of the existing level of military security.

These objectives generally limit the boundary of the plan to the existing Miramar area bounded by Interstates 15 and 805, State Route 52 and Miramar Road. They also require a large separation between civilian and military facilities.

MIRAMAR NAVAL AIR STATION TODAY

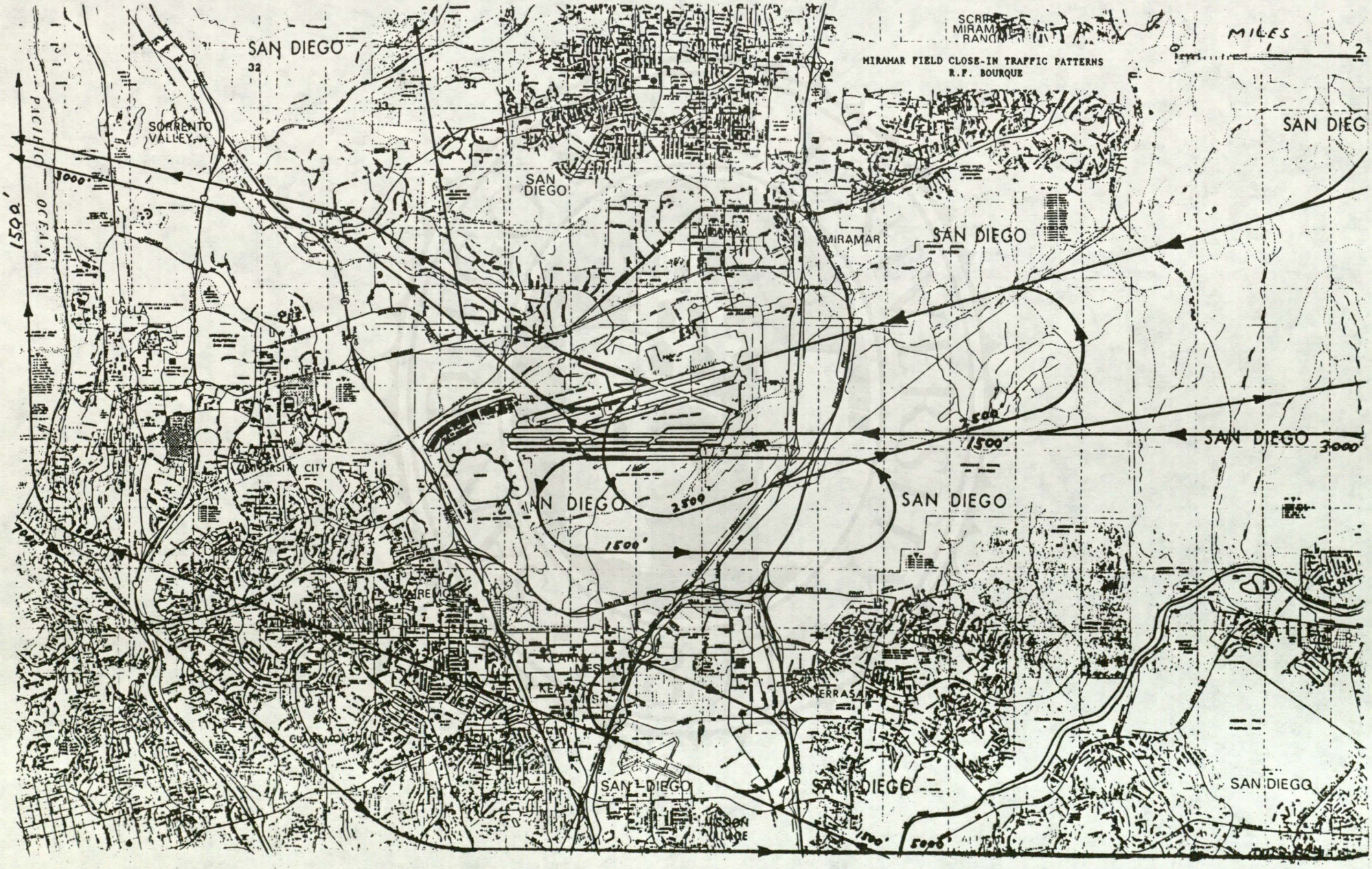




MIRAMAR FIELD
International Airport and Naval Air Station

SURFACE PLAN

R.F. Bourque


MIRAMAR FIELD CLOSE-IN TRAFFIC PATTERNS
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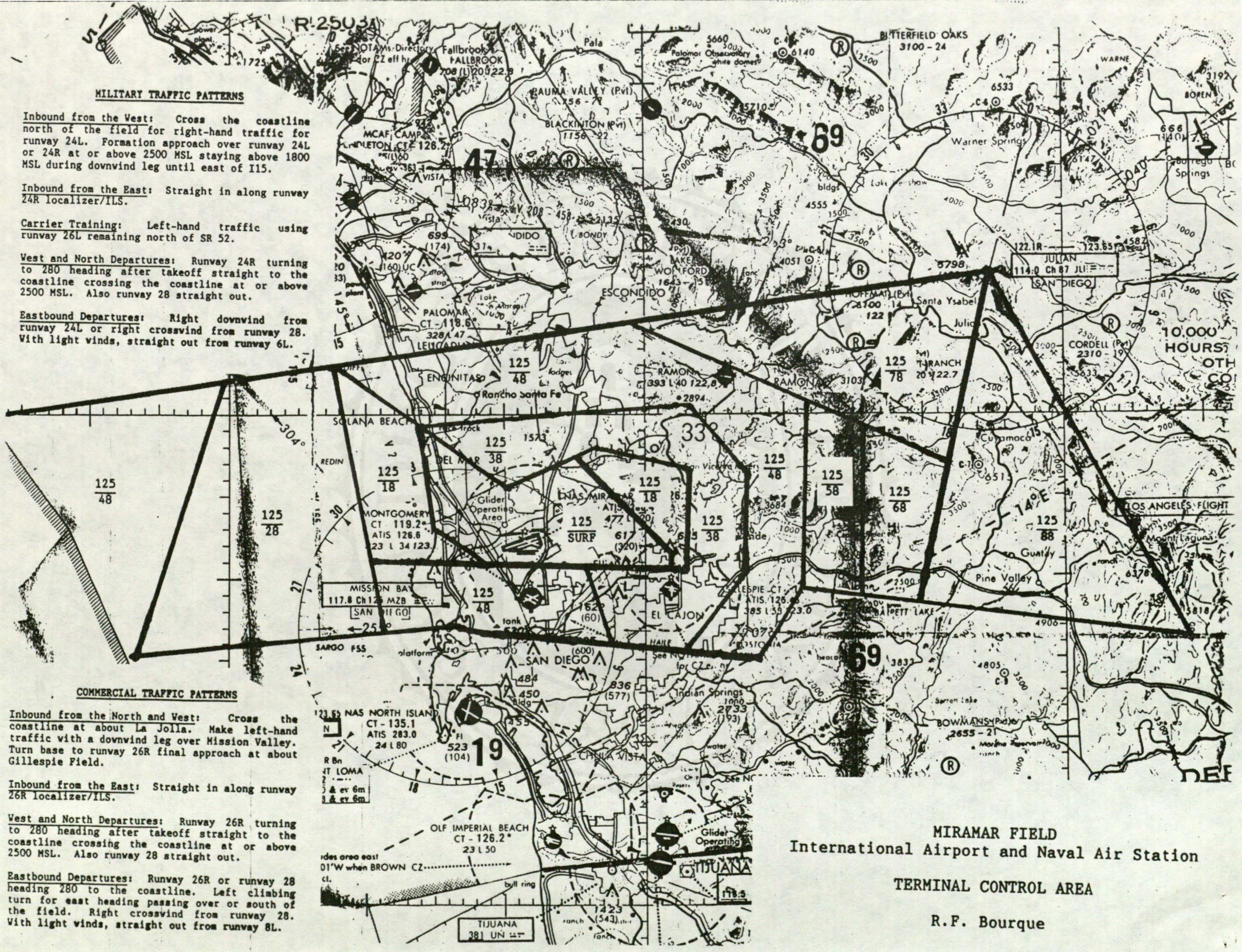

MILITARY TRAFFIC PATTERNS

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MIRAMAR FIELD
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TERMINAL CONTROL AREA

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MIRAMAR FIELD TCA TRAFFIC PATTERNS
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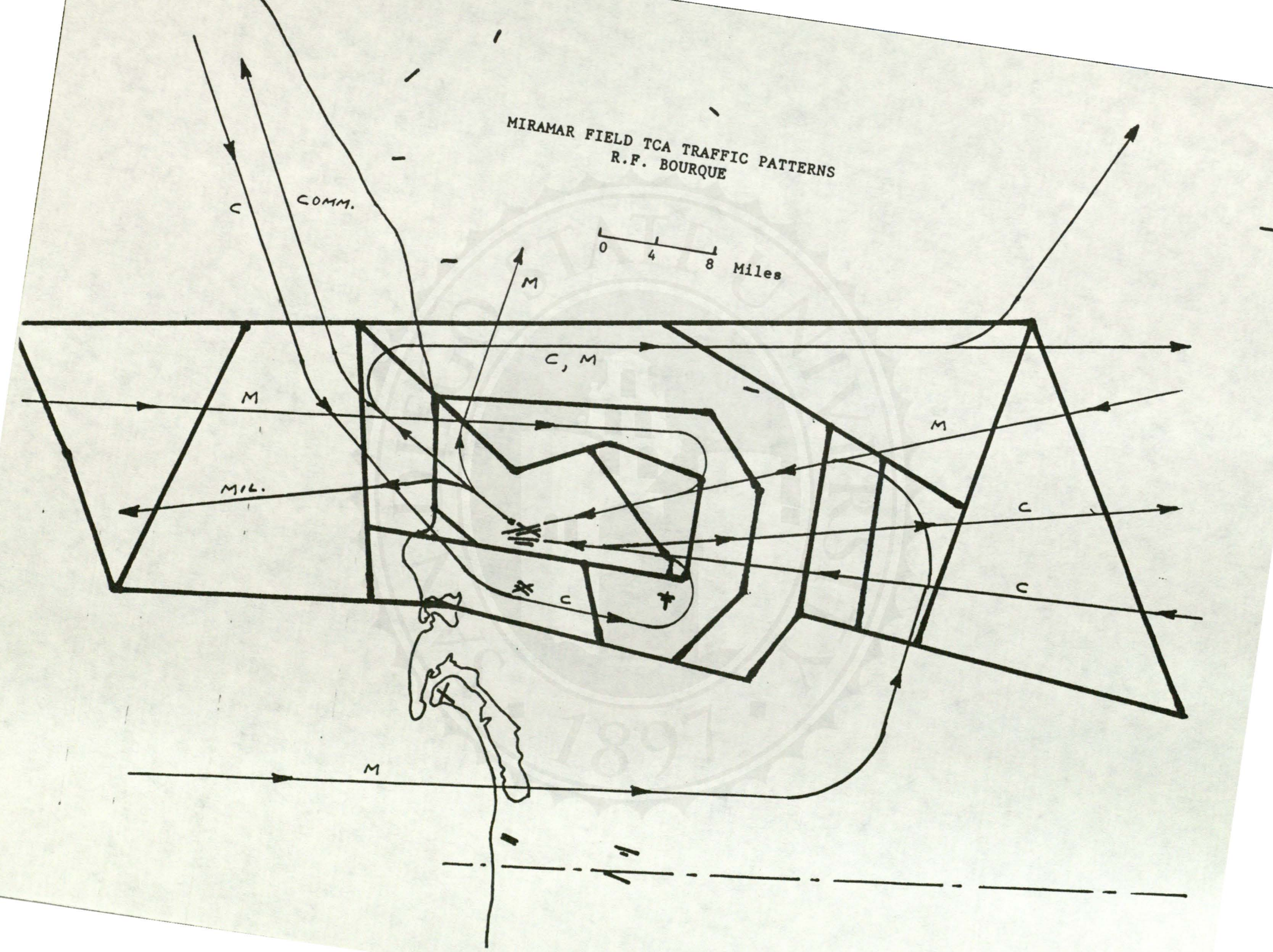


TRAFFIC PATTERNS

- The 20° divergence between the main military and commercial runways allows for well-separated ILS approaches and military formation approaches.

- The commercial glideslope can be 3.5^{o} from Mt. Laguna.

- Commercial approaches are south of the field while military approaches are generally to the north.

- Straight out departures to the coastline are sequenced with the faster aircraft cleared first.

- Straight out eastbound commercial departures reduce the amount of time in the traffic area by more than half.

- There is 1300' separation between the carrier practise and commercial approach tracks.

- There appears to be no conflict between Miramar and Montgomery traffic.

NOISE ISSUES

- This is the only site where the noise level is already substantial and nearby residents have learned to tolerate it. Other sites would introduce noise where none has been before.

- Noise levels would increase a little in north Tierrasanta and east University City.

- They may actually drop slightly in Scripps Ranch and Mira Mesa because of the southward shift of the carrier practice pattern.

- In areas more than a mile from the field, noise levels should either stay about the same or reduce despite the greater traffic volume because of the effects of the eucalyptus forest and the more flexible TCA.

ROBERT F. BOURQUE
2/10/90

POSSIBLE ALTERATIONS TO THE PLAN

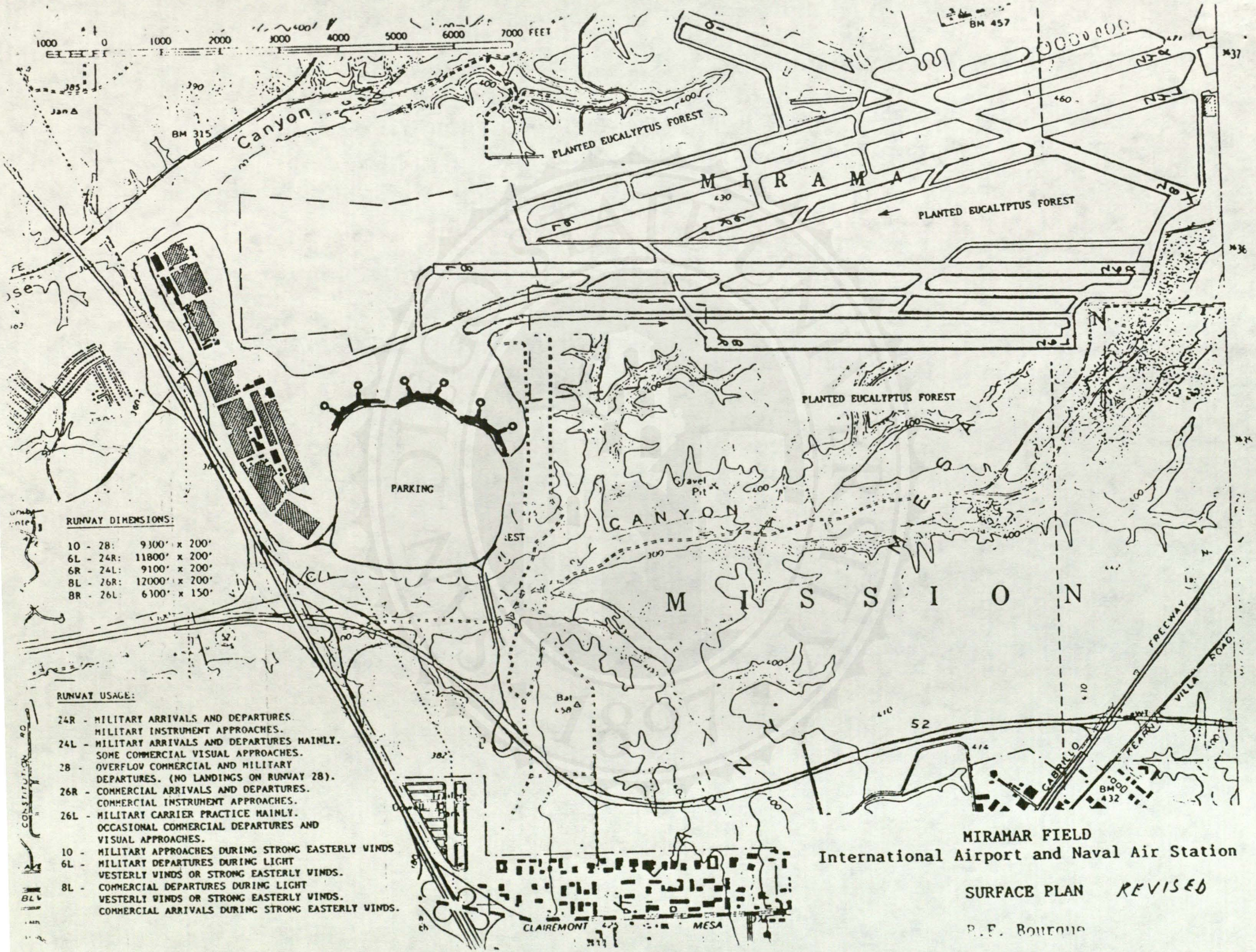
- Clear zones west of the runways can be increased to satisfy Navy requirements by not utilizing all of the land for industrial and terminal areas, by moving industrial areas from the northern to western boundary, and by rotating runways 26L and 26R about 8° counterclockwise.

SEE REVISED SURFACE PLAN

- These runways would then become 25L and 25R. There would still be sufficient separation for ILS arrivals. As a bonus, carrier practise traffic on runway 25L would be further removed from north Tierrasanta.

- Commercial departure traffic would make a 30° right turn to the coastline, the same as currently at Lindbergh, rather than 20°.

- This plan has been developed by one person working on his own time. No doubt there are other improvements that can make it even better.



MIRAMAR FIELD
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SURFACE PLAN REVISED

R.E. Bourque

SAFETY ISSUES

- The level of safety that must be assured to civilians is the same whether they are in residences, shopping areas or commercial aircraft. The military operations at Miramar have so far been deemed safe enough for the first two. There are therefore safe enough for the last one as well.

- This plan separates commercial and military arrivals to the point where overlap is minimal.

- The different performance envelopes tend to increase aircraft separation during departures.

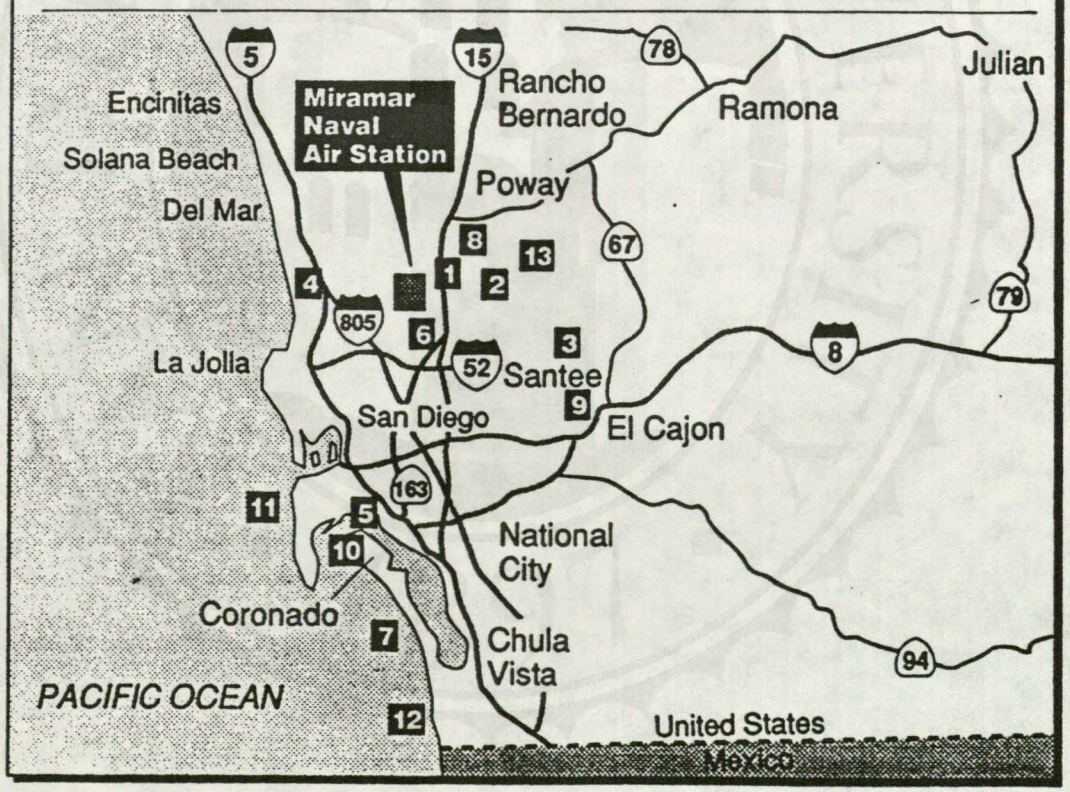
- The combined traffic density is still less than at Boston or St. Louis, and weather and winds are more favorable.

- Delays are unlikely and military aircraft approaching with low fuel supplies will have as much runway access as they do now, and possibly more.

Miramar air crashes in San Diego County

There have been 13 major accidents locally involving aircraft from Miramar Naval Air Station since the late 1970s.

- 13 A-4F; Nov. 30, 1989
- 12 TA-4; Oct. 5, 1989
- 11 F-14A; Aug. 2, 1989
- 10 EA-6B; 2 dead; July 24, 1989
- 9 F-14; 1 dead; Sept. 12, 1988
- 8 F-14; May 20, 1987
- 7 F-14; 1 dead; Sept. 4, 1986
- 6 FA-18; 1 dead; Dec. 3, 1985
- 5 TA-4; 1 dead; May 25, 1985
- 4 F-8; March 11, 1985
- 3 F-14; March 3, 1980
- 2 A-4; Jan. 24, 1979
- 1 F-14; March 27, 1978



The San Diego Union

Commercial activities at Miramar would not have been impacted by recent crashes of naval aircraft since they occurred offsite.

SUMMARY

- Use of Miramar offers the best solution to the aviation problem in San Diego.

- The site is centally located and has excellent freeway access.

- The plan offered here can readily meet the rational needs of both the military and the airlines. There is also room for industrial activity.

- Compatibility, noise and safety issues are readily dealt with by

    1. separating commercial and military activities on the ground and in the air,
    2. having more flexible controlled airspace so that departing aircraft are not constrained from reaching high altitude,
    3. by providing a noise-absorbing forest.

Summary, cont.

- Two of the five runways are for military use and one is for commercial use. The last is long enough to allow for many straight out eastbound departures. The remaining two runways can be shared, although one could be used as the primary military departure runway.

- Runways, taxiways, and ground facilities are placed so that they are operationally independent, military security is accounted for, and the environmental impact is minimal.

- The plan appears to provide all of the capability required at minimum possible cost and minimum disruption during construction.

- The plan is sufficiently superior to the existing situation to justify the expense and inconvenience of making the move.