COPY #1

THE UNITED STATES
STRATEGIC BOMBING SURVEY

(Pacific)

Evaluation of Photographic Intelligence in the Japanese Homeland

PART TEN
ROADS AND RAILROADS

PHOTOGRAPHIC INTELLIGENCE SECTION

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Dates of Survey:
7 October 1945 through 1 March 1946

JUNE 1946

F O R E W O R D

The United States Strategic Bombing Survey was established by the Secretary of War on 3 November 1944, pursuant to a Directive from the late President Roosevelt. Its mission was to conduct an impartial and expert study of the effects of our aerial attack on Germany, to be used in connection with air attacks on Japan and to establish a basis for evaluating the importance and potentialities of air power as an instrument of military strategy, for planning the future development of the United States armed forces, and for determing future economic policies with respect to the national defense. A summary report and some 200 supporting reports containing the fincings of the Survey in Germany have been published.

On 15 August 1945, President Truman requested that the Survey conduct a similar study of the effects of all types of air attack in the war against Japan, submitting reports in duplicate to the Secretary of War and to the Secretary of the Navy. The officers of the Survey during its Japanese phase were.

Franklin D'Olier, Chairman.

Paul H. Nitze,

Henry C. Alexander, Vice-Chairmen.

Walter Wilds, Secretary.

Harry L. Bowman,

J. K. Galbraith,

Rensis Likert,

Frank A. McNamee,

Fred Searls, Jr.,

Monroe Spaght,

Dr. Louis K. Thompson,

Theodore P. Wright, Directors.

The Survey's complement provided for 300 civilians, 350 officers, and 500 enlisted men. The military segment of the organization was drawn from the Army to the extent of 60 per cent, and from the Navy to the extent of 40 per cent. Both the Army and the Navy gave the Survey all possible assistance in furnishing men, supplies, transport and information. The Survey operated from headquarters established in Tokyo early in September, 1945, with sub-headquarters in Nagoya, Osaka, Hiroshima and Nagasaki, and with mobile teams operating in other parts of Japan, the islands of the Pacific, and the Asiatic mainland.

It was possible to reconstruct much of wartime Japanese military planning and execution, engagement by engagement and campaign by campaign, and to secure reasonably accurate statistics on Japan's economy and war-production, plant by plant and industry by industry. In addition, studies were conducted on Japan's overall strategic plans and the background of her entry into the war, the internal discussions and negotiations leading to her acceptance of unconditional surrender, the course of health and morale among the civilian population, the effectiveness of the Japanese civilian defense organization, and the effects of the atomic bombs. Separate reports will be issued covering each phase of the study.

The Survey interrogated more than 700 Japanese military, government and industrial officials. It also recovered and translated many documents which have not only been useful to the Survey, but will also furnish data valuable for other studies. Arrangements are being made to turn over the Survey's files to a permanent government agency where they will be available for further examination and distribution.

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LAND TRANSPORTATION

I INTRODUCTION

INTRODUCTION

1. That phase of photographic intelligence concerned with roads, railroads and bridges was probably the least developed of any phase of the work on the Japanese Homeland. Land transportation was not an important strategic target at any time during the war, although scheduled for attention at the time the war ended, and it was not until commencement of the detailed planning of the invasion of Southern Kyushu that any significant work on transportation was started. JICPOA, ComPhibsPac, Interpron TWO, and possibly other organizations prepared publications showing in varying detail the road and railroad network in Southern Kyushu. These publications, representing as they do only a preliminary study, were far from complete and are not representative of the completeness and accuracy which could have been attained had the work not been terminated by the end of the war, as shown by the excellent work on land transportation in China done by the 18th Photographic Intelligence Detachment, attached to the XIV Air Force.

2. The main body of this report is concerned with an evaluation of the photographic intelligence on the land transportation network in certain sections of Southern Kyushu. The photographic intelligence checked is from a series of situation maps prepared by Photographic Interpretation Squadron TWO. This source was checked because it was the latest publication on the subject, and incomplete as it was, contained more information than earlier publications. Information on the road and railroad networks in the sample areas was obtained from the Road Section, Public Works Department, Japanese Home Ministry, and the Planning Section, Civil Engineering Bureau, Japanese Ministry of Communications.

II EVALUATION

1. ROADS

a. Roads were classified by the categories primary and secondary on the situation maps. A primary road was defined as a surfaced road, width 20 feet or greater, and a secondary road a surfaced road, width 12 to 20 feet. Unsurfaced roads were not indicated except insofar as they appeared on the Japanese Imperial Land Survey Maps used as a base. The Japanese divided the roads into five categories, as follows:

Class I	Improved and paved, 14 feet or wider
Class II	Improved, 14 feet or wider
ClassIII	Unimproved, gravel, 14 feet or wider
Class IV	Unimproved, gravel, 11 - 14 feet
Class V	Unimproved, gravel, 11 feet or less

b. In the area of Southern Kyushu under consideration the Japanese report a total of only 120 miles of roads which correspond to the classifications primary and secondary while the situation map showed 709 miles so classified. Table I compares the photographic intelligence classification with the actual Japanese classification:

TABLE 1
COMPARISION OF ROAD CLASSIFICATION
SOUTHERN KYUSHU

Miles	Situation Map Classification	Japanese Classification
38	Primary	Class I
82	Primary	Class II
226	Primary	Class III
342	Primary	Class IV
7	Secondary	Class III
9	Secondary	Class IV
15	Secondary	Class V
[illegible]		

CONCLUSIONS

c. It is quite clear from the figures that the situation maps presented an exceedingly optimistic picture of the road conditions in Southern Kyushu. The consistency of the errors in this regard is attributed (1) to a lack of realization on the part of the interpreters involved of the vast difference between the road systems of Japan and those of the United States, and (2) to the inherent difficulty in distinguishing between one type of road surface and another, since a muddy unimproved road may reflect approximately the same amount of light and thus appear the same photographically as a paved one.

2. RAILROADS

a. Due to the standardized construction methods used throughout the world and the definite pattern made by the tracks little difficulty was experienced in the interpretation of the railway network. No errors were made in the sample area.

3. BRIDGES

a. The principal characteristics studied in the interpretation of bridges were length, width, type, and materials of construction. This work suffered from the same shortcoming as did that of roads, in that bridges were generally of lighter construction than reported. The most common errors were (1) classifying wooden structures as concrete structures, not surprising in view of the limited amount of structural detail discernable in a plan view photograph, and (2) errors in dimensions primarily resulting from inability always to distinguish between a bridge and its approaches. The interpretation of railroad bridges was more accurate than that of road bridges for the same reason that the interpretation of railroads was more accurate than that of roads. In table 2 the Japanese data on road and railroad bridges in several sample areas is compared with the photographic intelligence data.

III CONCLUSIONS

1. Photographic intelligence material ~~material~~ published on land transportation was intended as target material for use in attack on and interdiction of the enemy's transportation facilities. For this purpose, it was adequate. The comparisons following, however, point out the inadequacy of this information for estimates of load-carrying capabilities, because of the generally optimistic impression given. While a generally true picture of the railroad system was given, road-surface conditions and bridge construction were overestimated to a great extent.

2. Road and bridge construction standards in Japan differ sharply from those in use in the United States, while railroad construction does not. Thus, little actual interpretation was necessary in connection with railroad targets, and a superficial knowledge on the part of the photographic interpreter is sufficient to classify such targets. Highway bridges, which have a great variation in material and construction type, require much greater attention and knowledge. Photographic interpreters trained in transportation construction, and with access to all ground information, would produce much more accurate information.

3. It would seem doubtful that satisfactory work on this type of subject can be done solely from vertical photographs, even of large scale. Large-scale, low-level oblique photographs are necessary to complete analysis of sub-structure, and are of great assistance in estimating road surface and carrying capacity.

4. Ready access to compiled ground information concerning this subject would have been invaluable, as time was a factor in the preparation and dissemination of target material. Lacking this, a considerable amount of effort was expended in locating and pinpointing individual targets, and more was spent in attempting to estimate types of construction which were standard Japanese practice but unknown to the photographic interpreters.

TABLE

TABLE 2

COMPARISON OF ACTUAL AND REPORTED BRIDGE STRUCTURES

SOUTHERN KYUSHU

NAME	REPORTED LENGTH (feet)	REPORTED MATERIAL	REPORTED TYPE	ACTUAL LENGTH (feet)	ACTUAL MATERIAL	ACTUAL TYPE
a. HIGHWAY BRIDGES — NATIONAL HIGHWAY 2 (KAGOSHIMA PREFECTURE)						
SYONO	150	Concrete	x	147	Wood	Beam
YONENOZU	440	Concrete	7-Span	422	Concrete	x
CHINNOO	70	Concrete	x	66	Concrete	Beam
OHIRA	600	Steel	x	635	Steel	Truss
YABUSA	200	Concrete	x	165	Stone	Arch
b. HIGHWAY BRIDGES — PREFECTURE ROADS						
OSEKO	210	Concrete	x	228	Stone	Arch
HISHIDA	310	Concrete	x	396	Concrete	Beam
HOEI	140	x	x	132	Concrete	Beam
MANNOSE-GAWA	300	x	x	264	Concrete	Beam
KURINO	160	x	x	188	Concrete	Beam
MIZUNOTE	100	Concrete	x	104	Concrete	Beam
SAKAE	260	Concrete	x	240	Concrete	Beam
TAKESEKO	130	Concrete	x	121	Concrete	x
HANAWATASHI	600	Concrete	x	348	Wood	Beam
HAMADA	140	Concrete	x	140	Stone	Arch
ANAGAWA	150	x	x	147	Stone	Arch
YUNOO	260	x	x	286	Concrete	Beam
MIYANOSHIRO	350	Steel	x	326	Concrete	Beam
TAMUKI	90	Concrete	x	102	Stone	Arch
KASHIWABARA	380	Steel	x	335	Concrete	Beam
TSURUTA	120	x	x	101	Concrete	Beam
SASHI	210	x	x	190	Stone	Arch
NOGUCHI	500	Concrete	x	512	Concrete	Beam
c. HIGHWAY BRIDGES — NATIONAL HIGHWAY 2 (KUMAMOTO PREFECTURE)						
KUMAGAWA	300	Concrete	x	576	Steel	Truss
MINAMATA	280	Concrete	x	288	Concrete	Beam
d. HIGHWAY BRIDGES — PREFECTURE ROADS						
SAGARA	320	Concrete	x	424	Steel	Truss & Plate Girder
MAEGAWA	240	Concrete	x	262	Wood	Beam
MINUGAWA	80	Concrete	x	129.9	Wood	Beam
MENDEN	280	Concrete	x	273	Concrete	Beam
KUGINOGAWA	120	Concrete	x	111	Concrete	Arch

TABLE

TABLE 2 (CONTINUED)

COMPARISON OF ACTUAL AND REPORTED BRIDGE STRUCTURES

SOUTHERN KYUSHU

NAME	REPORTED LENGTH (feet)	REPORTED MATERIAL	REPORTED TYPE	ACTUAL LENGTH (feet)	ACTUAL MATERIAL	ACTUAL TYPE
e. HIGHWAY BRIDGES — NATIONAL HIGHWAY 3 (MIYAZAKI PREFECTURE)						
ISUZU	300	Concrete	x	378	Wood	Beam
SHIOMI	490	Concrete	x	354	Wood	Beam
MIMIZU	200	Concrete	x	530	Steel	Arch
NANUKI	485	Concrete	x	410	Wood	Beam
OBUCHI	1000	Concrete	x	840	Wood	Beam
FUKUSHIMA	500	Concrete	x	467	Wood	Beam
TACHIBANA	1380	Conc. & Steel	x	1240	Concrete	Hinge-less Arch
YAMASHITA	300	Concrete	x	313	Steel	Truss
OKIMIZU	570	Wood	x	506	Wood	Beam
f. HIGHWAY BRIDGES — PREFECTURE ROADS						
KIZAKI	350	Concrete	x	297	Concrete	Beam
UNOGI	485	Concrete	x	490	Wood	Beam
CHIHUKU	160	Concrete	x	250	Wood	Beam
IMAMACHI	360	Concrete	x	309	Wood	Beam, Truss
IWASE	120	x	x	120	Steel	Truss
YOKUYA	280	Concrete	x	220	Wood	Beam
NIZYURI	120	Concrete	x	106	Wood	Beam
KAKUTO	480	Concrete	x	362	Wood	Beam
ARISHIMA	170	Concrete	x	136	Wood	Beam
SAKAMOTO	300	Concrete	x	308	Wood	Truss, Beam
IMAMACHI	380	Concrete	x	355	Wood	Beam
OYODO	400	Concrete	x	462	Wood	Beam
IWAZAKI	300	Concrete	x	272	Steel, Wood	Truss, Beam
HEGURI	200	x	x	170	Wood	Beam
g. RAILWAY BRIDGES — NIPPO MAIN LINE (S E — KYUSHU)						
OYODO-GAWA	1540	Steel	x	1330	Steel	Plate girder
HITOSUSE-GAWA	18-Span	Steel	x	1470	Steel	x
TENJIN-GAWA	320	x	x	270	x	x
KOMARU-GAWA	2750	Steel	36 span @ 75'	2450	Steel	35 span @ 70'

UNITED STATES STRATEGIC BOMBING SURVEY

European War

LIST OF REPORTS

The following list of studies is a bibliography of completed reports resulting from the German survey. Reports numbers 1, 2, and 3 can be purchased from the Superintendent of Documents, Government Printing Office, Washington, D. C. Permission to examine the remaining reports may be had by writing to the headquarters of the Survey at Gravelly Point, Washington 25, D. C.

1 The United States Strategic Bombing Survey: Summary Report (European War)
2 The United States Strategic Bombing Survey: Over-all Report (European War)
3 The Effects of Strategic Bombing on the German War Economy

AIRCRAFT DIVISION

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4 Aircraft Division Industry Report
5 Inspection Visits to Various Targets (Special Report)

Airframes Branch

6 Junkers Aircraft and Aero Engine Works, Dessau, Germany
7 Erla Maschinenwerke G m b H, Heiterblick, Germany
8 A T G Maschinenbau, G m b H, Leipzig (Mockau), Germany
9 Gothaer Waggonfabrik, A G, Gotha, Germany
10 Focke Wulf Aircraft Plant, Bremen, Germany
11. Messerschmitt A G, Augsburg, Germany — Over-all Report; Part A; Part B; Appendices I, II, III
12 Dornier Works, Friedrichshafen & Munich, Germany
13 Gerhard Fiesler Werke G m b H, Kassel, Germany
14 Wiener Neustaedter Flugzeugwerke, Wiener Neustadt, Austria

Aero Engines Branch

15 Bussing NAG Flugmotorenwerke G m b H, Brunswick, Germany
16 Mittel-Deutsche Motorenwerke G m b H, Taucha, Germany
17 Bavarian Motorworks Inc, Eisenach & Durrenhof, Germany
18 Bayerische Motorenwerke A G (BMW) Munich, Germany
19 Henschel Flugmotorenwerke, Kassel, Germany

Light Metal Branch

20 Light Metals Industry of Germany — Part I, Aluminum; Part II, Magnesium
21 Vereinigte Deutsche Metallwerke, Hildesheim, Germany
22 Metallgussgesellschaft G m b H, Leipzig, Germany
23 Aluminiumwerk G m b H, Plant No. 2, Bitterfeld, Germany
24 Gebrueder Giulini G m b H, Ludwigshafen, Germany
25 Luftschiffbau Zeppelin G m b H, Friedrichshafen on Bodensee, Germany
26 Wieland Werke A G, Ulm, Germany
27 Rudolph Rautenbach Leichtmetallgiessereien. Solingen, Germany
28 Lippewerke Vereinigte Aluminiumwerke A G, Lunen, Germany
29 Vereinigte Deutsche Metallwerke, Heddernheim, Germany
30 Duerener Metallwerke A G, Duren Wittenau-Berlin & Waren, Germany

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31 Area Studies Division Report
32 A Detailed Study of the Effects of Area Bombing on Hamburg
33 A Detailed Study of the Effects of Area Bombing on Wuppertal
34 A Detailed Study of the Effects of Area Bombing on Dusseldorf
35 A Detailed Study of the Effects of Area Bombing on Solingen
36 A Detailed Study of the Effects of Area Bombing on Remscheid
37 A Detailed Study of the Effects of Area Bombing on Darmstadt
38 A Detailed Study of the Effects of Area Bombing on Lubeck
39 A Brief Study of the Effects of Area Bombing on Berlin, Augsburg, Bochum, Leipzig, Hagen, Dortmund, Oberhausen, Schweinfurt, and Bremen

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40 Civilian Defense Division—Final Report
41 Cologne Field Report
42 Bonn Field Report
43 Hanover Field Report
44 Hamburg Field Report—Vol I, Text; Vol II, Exhibits
45 Bad Oldesloe Field Report
46 Augsburg Field Report
47 Reception Areas in Bavaria, Germany

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Electrical Branch

48 German Electrical Equipment Industry Report
49 Brown Boveri et Cie, Mannheim Kafertal, Germany

Optical and Precision Instrument Branch

50 Optical and Precision Instrument Industry Report

Abrasives Branch

51 The German Abrasive Industry
52 Mayer and Schmidt, Offenbach on Main, Germany

Anti-Friction Branch

53 The German Anti-Friction Bearings Industry

Machine Tools Branch

54 Machine Tools & Machinery as Capital Equipment
55 Machine Tool Industry in Germany
56 Herman Kolb Co, Cologne, Germany
57 Collet and Engelhard, Offenbach, Germany
58 Naxos Union, Frankfort on Main, Germany

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64 Description of RAF Bombing

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67 Coking Plant Report No. 1, Sections A, B, C, & D
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69 Friedrich-Alfred Hutte, Rheinhausen, Germany
70 Neunkirchen Eisenwerke A G, Neunkirchen, Germany
71 Reichswerke Hermann Goering A G, Hallendorf, Germany
72 August Thyssen Huette A G, Hamborn, Germany
73 Friedrich Krupp A G, Borbeck Plant, Essen, Germany
74 Dortmund Hoerder Huettenverein, A G, Dortmund, Germany
75 Hoesch A G, Dortmund, Germany
76 Bochumer Verein fuer Gusstahlfabrikation A G, Bochum, Germany

Motor Vehicles and Tanks Branch

77 German Motor Vehicles Industry Report
78 Tank Industry Report
79 Daimler Benz A G, Unterturkheim, Germany
80 Renault Motor Vehicles Plant, Billancourt, Paris
81 Adam Opel, Russelheim, Germany
82 Daimler Benz-Gaggenau Works, Gaggenau, Germany
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86 Maybach Motor Works, Friedrichshafen, Germany
87 Voigtlander Maschinenfabrik A G, Plauen, Germany
88 Volkswagenwerke, Fallersleben, Germany
89 Bussing NAG, Brunswick, Germany
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92 German Submarine Industry Report
93 Maschinenfabrik Augsburg-Nurnberg A G, Augsburg, Germany
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95 Deutschewerke A G, Kiel, Germany
96 Deutsche Schiff und Maschinenbau, Bremen, Germany
97 Friedrich Krupp Germaniawerft, Kiel, Germany
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100 Bremer Vulkan, Vegesack, Germany

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103 Bochumer Verein fuer Gusstahlfabrikation A G, Bochum, Germany
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106 Hermann Goering Werke, Braunschweig, Hallendorf, Germany
107 Hannoverische Maschinenbau, Hanover, Germany
108 Gusstahlfabrik Friedrich Krupp, Essen, Germany

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109 Oil Division Final Report
110 Oil Division Final Report, Appendix
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112 Underground and Dispersal Plants in Greater Germany
113 The German Oil Industry, Ministerial Report Team 78
114 Ministerial Report on Chemicals

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115 Ammoniakwerke Merseburg G m b H, Leuna, Germany—2 appendices
116 Braunkohle Benzin A G, Zeitz and Bohlen, Germany
Wintershall A G, Luetzkendorf, Germany
117 Ludwigshafen-Oppau Works of I G Farbenindustrie A G, Ludwigshafen, Germany
118 Ruhroel Hydrogenation Plant, Bottrop-Boy, Germany, Vol I, Vol II
119 Rhenania Ossag Mineraloelwerke A G, Harburg Refinery, Hamburg, Germany
120 Rhenania Ossag Mineraloelwerke A G, Grassbrook Refinery, Hamburg, Germany
121 Rhenania Ossag Mineraloelwerke A G, Wilhelmsburg Refinery, Hamburg, Germany
122 Gewerkschaft Victor, Castrop-Rauxel, Germany, Vol I & Vol II
123 Europaeische Tanklager und Transport A G, Hamburg, Germany
124 Ebano Asphalt Werke A G, Harburg Refinery, Hamburg, Germany
125 Meerbeck Rheinpreussen Synthetic Oil Plant—Vol I & Vol II

Rubber Branch

126 Deutsche Dunlop Gummi Co., Hanau on Main, Germany
127 Continental Gummiwerke, Hanover, Germany
128 Huels Synthetic Rubber Plant
129 Ministerial Report on German Rubber Industry

Propellants Branch

130 Elektro Chemischewerke, Munich, Germany
131 Schoenebeck Explosive Plant, Lignose Sprengstoff Werke G m b H, Bad Salzemen, Germany
132 Plants of Dynamit A G, Vormal, Alfred Nobel & Co, Troisdorf, Clausthal, Drummel and Duneberg, Germany
133 Deutsche Sprengchemie G m b H, Kraiburg, Germany

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140 Submarine Pens, Brest, France
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168 Erla Maschinenwerke G m b H, Mockau, Germany
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170 Mittel-Deutsche Motorenwerke G m b H, Taucha, Germany
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177 Adam Opel A G, Russelheim, Germany
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196 I G Farbenindustrie, Leverkusen, Germany
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201 Rail Operations Over the Brenner Pass
202 Effects of Bombing on Railroad Installations in Regensburg, Nurnberg and Munich Divisions.
203 German Locomotive Industry During the War
204 Wehrmacht Traffic Over the German Railroads

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205 German Electric Utilities Industry Report
206 1 to 10 in Vol I "Utilities Division Plant Reports"
207 11 to 20 in Vol II "Utilities Division Plant Reports"
208 21 Rheinische-Westfalische Elektrizitatswerk A G

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UNITED STATES STRATEGIC BOMBING SURVEY
PHOTOGRAPHIC INTELLIGENCE SECTION

EVALUATION OF PHOTOGRAPHIC INTELLIGENCE IN THE JAPANESE HOMELAND

PART TEN
ROADS AND RAILROADS

DATES OF SURVEY: 7 OCTOBER — 29 NOVEMBER 1945

DATE OF PUBLICATION

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LAND TRANSPORTATION

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9	Secondary	Class IV
5	Secondary	Class V
709		

CONCLUSIONS

c. It is quite clear from the figures that the situation maps presented an exceedingly optimistic picture of the road conditions in Southern Kyushu. The consistency of the errors in this regard is attributed (1) to a lack of realization on the part of the interpreters involved of the vast difference between the road systems of Japan and those of the United States, and (2) to the inherent difficulty in distinguishing between one type of road surface and another, since a muddy unimproved road may reflect approximately the same amount of light and thus appear the same photographically as a paved one.

2. RAILROADS

a. Due to the standardized construction methods used throughout the world and the definite pattern made by the tracks little difficulty was experienced in the interpretation of the railway network. No errors were made in the sample area.

3. BRIDGES

a. The principal characteristics studied in the interpretation of bridges were length, width, type, and materials of construction. This work suffered from the same shortcoming as did that of roads, in that bridges were generally of lighter construction than reported. The most common errors were (1) classifying wooden structures as concrete structures, not surprising in view of the limited amount of structural detail discernable in a plan view photograph, and (2) errors in dimensions primarily resulting from inability always to distinguish between a bridge and its approaches. The interpretation of railroad bridges was more accurate than that of road bridges for the same reason that the interpretation of railroads was more accurate than that of roads. In tables 2 and 3 the Japanese data on road and railroad bridges in several sample areas is compared with the photographic intelligence data.

III CONCLUSIONS

1. Photographic intelligence material material published on land transportation was intended as target material for use in attack on and interdiction of the enemy's transportation facilities. for this purpose, it was adequate. The comparisons following, however, point out the inadequacy of this information for estimates of load-carrying capabilities, because of the generally optimistic impression given. While a generally true picture of the railroad system was given, road-surface conditions and bridge construction were overestimated to a great extent.

2. Road and bridge construction standards in Japan differ sharply from those in use in the United States, while railroad construction does not. Thus, little actual interpretation was necessary in connection with railroad targets, and a superficial knowledge on the part of the photographic interpreter is sufficient to classify such targets. Highway bridges, which have a great variation in material and construction type, require much greater attention and knowledge. Photographic interpreters trained in transportation construction, and with access to all ground information, would produce much more accurate information.

3. It would seem doubtful that satisfactory work on this type of subject can be done solely from vertical photographs, even of large scale. Large-scale, low-level oblique photographs are necessary to complete analysis of sub-structure, and are of great assistance in estimating road surface and carrying capacity.

4. Ready access to compiled ground information concerning this subject would have been invaluable, as time was a factor in the preparation and dissemination of target material. Lacking this, a considerable amount of effort was expended in locating and pinpointing individual targets, and more was spent in attempting to estimate types of construction which were standard Japanese practice but unknown to the photographic interpreters.

TABLE

TABLE 2

COMPARISON OF ACTUAL AND REPORTED BRIDGE STRUCTURES

SOUTHERN KYUSHU

	REPORTED			ACTUAL		
NAME	LENGTH (feet)	MATERIAL	TYPE	LENGTH (feet)	MATERIAL	TYPE
a. HIGHWAY BRIDGES — NATIONAL HIGHWAY 2 (KAGOSHIMA PREFECTURE)						
SYONO	150	Concrete	x	147	Wood	Beam
YONENOZU	440	Concrete	7-Span	422	Concrete	x
CHINNOO	70	Concrete	x	66	Concrete	Beam
OHIRA	600	Steel	x	635	Steel	Truss
YABUSA	200	Concrete	x	165	Stone	Arch
b. HIGHWAY BRIDGES — PREFECTURE ROADS						
OSEKO	210	Concrete	x	228	Stone	Arch
HISHIDA	310	Concrete	x	396	Concrete	Beam
HOEI	140	x	x	132	Concrete	Beam
MANNOSE-GAWA	300	x	x	264	Concrete	Beam
KURINO	160	x	x	188	Concrete	Beam
MIZUNOTE	100	Concrete	x	104	Concrete	Beam
SAKAE	260	Concrete	x	240	Concrete	Beam
TAKESEKO	130	Concrete	x	121	Concrete	x
HANANATASHI	600	Concrete	x	348	Wood	Beam
HAMADA	140	Concrete	x	140	Stone	Arch
ANAGAWA	150	x	x	147	Stone	Arch
YUNOO	260	x	x	286	Concrete	Beam
MIYANOSHIRO	350	Steel	x	326	Concrete	Beam
TAMUKI	90	Concrete	x	102	Stone	Arch
KASHIWABARA	380	Steel	x	335	Concrete	Beam
TSURUTA	120	x	x	101	Concrete	Beam
SASHI	210	x	x	190	Stone	Arch
NOGUCHI	500	Concrete	x	512	Concrete	Beam
c. HIGHWAY BRIDGES — NATIONAL HIGHWAY 2 (KUMAMOTO PREFECTURE)						
KUMAGAWA	300	Concrete	x	576	Steel	Truss
MINAMATA	280	Concrete	x	288	Concrete	Beam
d. HIGHWAY BRIDGES — PREFECTURE ROADS						
SAGARA	320	Concrete	x	424	Steel	Truss & Plate Girder
MAEGAWA	240	Concrete	x	262	Wood	Beam
MINUGAWA	80	Concrete	x	129.9	Wood	Beam
MENDEN	280	Concrete	x	273	Concrete	Beam
KUGINOGAWA	120	Concrete	x	111	Concrete	Arch

TABLE

TABLE 2 (CONTINUED)

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SOUTHERN KYUSHU

REPORTED				ACTUAL		
NAME	LENGTH (feet)	MATERIAL	TYPE	LENGTH (feet)	MATERIAL	TYPE
e. HIGHWAY BRIDGES — NATIONAL HIGHWAY 3 (MIYAZAKI PREFECTURE)						
ISUZU	300	Concrete	x	378	Wood	Beam
SHIOMI	490	Concrete	x	354	Wood	Beam
MIMIZU	200	Concrete	x	530	Steel	Arch
NANUKI	485	Concrete	x	410	Wood	Beam
OBUCHI	1000	Concrete	x	840	Wood	Beam
FUKUSHIMA	500	Concrete	x	467	Wood	Beam
TACHIBANA	1380	Conc. & Steel	x	1240	Concrete Hingeless Arch	
YAMASHITA	300	Concrete	x	313	Steel	Truss
OKIMIZU	570	Wood	x	506	Wood	Beam
f. HIGHWAY BRIDGES — PREFECTURE ROADS						
KIZAKI	350	Concrete	x	297	Concrete	Beam
UNOGI	485	Concrete	x	490	Wood	Beam
CHIHUKU	160	Concrete	x	250	Wood	Beam
IMAMACHI	360	Concrete	x	309	Wood Beam, Truss	
IWASE	120	x	x	120	Steel	Truss
YOKUYA	280	Concrete	x	220	Wood	Beam
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SAKAMOTO	300	Concrete	x	308	Wood Truss, Beam	
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OYODO	400	Concrete	x	462	Wood	Beam
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HEGURI	200	x	x	170	Wood	Beam
g. RAILWAY BRIDGES — NIPPO MAIN LINE (S E — KYUSHU)						
OYODO-GAWA	1540	Steel	x	1330	Steel	Plate girder
HITOSUSE-GAWA	18-Span	Steel	x	1470	Steel	x
TENJIN-GAWA	320	x	x	270	x	x
KOMARU-GAWA	2750	Steel	36 span @ 75'	2450	Steel	35 span @ 70'

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UNITED STATES STRATEGIC BOMBING SURVEY
PHOTOGRAPHIC INTELLIGENCE SECTION

EVALUATION OF PHOTOGRAPHIC INTELLIGENCE IN THE JAPANESE HOMELAND

PART TEN
ROADS AND RAILROADS

DATES OF SURVEY: 7 OCTOBER 1945 — 1 MARCH 1946

DATE OF PUBLICATION

TABLE OF CONTENTS

LAND TRANSPORTATION

I INTRODUCTION

INTRODUCTION

1. That phase of photographic intelligence concerned with roads, railroads and bridges was probably the least developed of any phase of the work on the Japanese Homeland. Land transportation was not an important strategic target at any time during the war, although scheduled for attention at the time the war ended, and it was not until commencement of the detailed planning of the invasion of Southern Kyushu that any significant work on transportation was started. JICPOA, ComPhibsPac, Interpron TWO, and possibly other organizations prepared publications showing in varying detail the road and railroad network in Southern Kyushu. These publications, representing as they do only a preliminary study, were far from complete and are not representative of the completeness and accuracy which could have been attained had the work not been terminated by the end of the war, as shown by the excellent work on land transportation in China done by the 18th Photographic Intelligence Detachment, attached to the XIV Air Force.

2. The main body of this report is concerned with an evaluation of the photographic intelligence on the land transportation network in certain sections of Southern Kyushu. The photographic intelligence checked is from a series of situation maps prepared by Photographic Interpretation Squadron TWO. This source was checked because it was the latest publication on the subject, and incomplete as it was, contained more information than earlier publications. Information on the road and railroad networks in the sample areas was obtained from the Road Section, Public Works Department, Japanese Home Ministry, and the Planning Section, Civil Engineering Bureau, Japanese Ministry of Communications.

II EVALUATION

I. ROADS

a. Roads were classified by the categories primary and secondary on the situation maps. A primary road was defined as a surfaced road, width 20 feet or greater, and a secondary road a surfaced road, width 12 to 20 feet. Unsurfaced roads were not indicated except insofar as they appeared on the Japanese Imperial Land Survey Maps used as a base. The Japanese divided the roads into five categories, as follows:

Class I	Improved and paved, 14 feet or wider
Class II	Improved, 14 feet or wider
ClassIII	Unimproved, gravel, 14 feet or wider
Class IV	Unimproved, gravel, 11 - 14 feet
Class V	Unimproved, gravel, 11 feet or less

b. In the area of Southern Kyushu under consideration the Japanese report a total of only 120 miles of roads which correspond to the classifications primary and secondary while the situation map showed 709 miles so classified. Table I compares the photographic intelligence classification with the actual Japanese classification:

TABLE 1
COMPARISION OF ROAD CLASSIFICATION
SOUTHERN KYUSHU

Miles	Situation Map Classification	Japanese Classification
38	Primary	Class I
82	Primary	Class II
226	Primary	Class III
342	Primary	Class IV
7	Secondary	Class III
9	Secondary	Class IV
15	Secondary	Class V
~~709~~		

CONCLUSIONS

c. It is quite clear from the figures that the situation maps presented an exceedingly optimistic picture of the road conditions in Southern Kyushu. The consistency of the errors in this regard is attributed (1) to a lack of realization on the part of the interpreters involved of the vast difference between the road systems of Japan and those of the United States, and (2) to the inherent difficulty in distinguishing between one type of road surface and another, since a muddy unimproved road may reflect approximately the same amount of light and thus appear the same photographically as a paved one.

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