

# NOSE HILL PARK LINEAR BIRD TRANSECTS 2006

Prepared by:  
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For:  
CITY OF CALGARY PARKS

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## EXECUTIVE SUMMARY

Sweetgrass Consultants Ltd. was contracted in 2006 to conduct linear transect surveys for birds along selected trails and pathways in Nose Hill Natural Environment Park to assist in the implementation of the Nose Hill Trail and Pathway Plan and associated trail and pathway system developments.

The objectives of the study included (1) the observation and documentation of birds nesting and foraging in proximity to pathways and trails; (2) analysis of results; and (3) formulation of mitigation strategies for trail and pathway construction.

A total of 13 linear transect routes in 6 areas of the Park were surveyed four times from June 25 to July 20, in conjunction with the circular bird plot surveys (see accompanying report). Singing and non-singing birds were recorded in two zones: within a band 5 meters on either side of the trail, and on 100 meters on either side of the trail.

Transect routes and individual stations were mapped in ArcGIS and UTM coordinates of individual stations were recorded. All observations were entered into a database that included information on species, location, date, time, habitat, observer, age/sex, behavior (singing, calling, flying etc.), and relevant notes.

In total, 12 species of birds that nest in the Park were observed in close proximity to pathways and trails. Of these species, only three were recorded on more than four occasions, and only two of these—Savannah Sparrow and Clay-colored Sparrow--were abundant. These two species are also common in the Calgary area. No rare or sensitive species were recorded along the linear transects.

The areas where birds were most frequently observed in close proximity to trails included trees and shrubs (individual or patches) and trails with dense vegetation along narrow walkways. While there were numerous observations of family groups (adults and young) close to trails, it is predicted that there is only a low density of nests in these situations. Based on the experience of the researchers, there is a greater chance that nests would be located along the smaller, low-use, more densely vegetated trails rather than along the busier, more heavily disturbed trails.

Potential impacts and suggested mitigation strategies for trail and pathway construction are presented.

## **1. INTRODUCTION**

Sweetgrass Consultants Ltd. was contracted in June 2006 to conduct linear transect surveys for birds along selected trails and pathways in Nose Hill Natural Environment Park. The results of this assessment assisted in planning and mitigating some of the potential impacts associated with implementation of the Nose Hill Trail and Pathway Plan, including planned trail and pathway construction.

This study was undertaken as a follow-up to the *Biophysical Impact Assessment Nose Hill Park – Cross-Park Pathways Routes*, prepared by URSUS Ecosystems Management Ltd. in June 2006, which identified potential project impacts to breeding birds during the breeding season (May 1 to July 31). In recognition of the potential project impacts identified in the BIA, The City of Calgary Parks initiated a park-wide bird monitoring study (see accompanying report) and this linear transect study to assess current bird populations and use patterns in the park, more closely examine the potential impacts of trail and pathway construction activities, and develop mitigation strategies to reduce the potential impacts of construction activities during the breeding bird season.

## **2. OBJECTIVES**

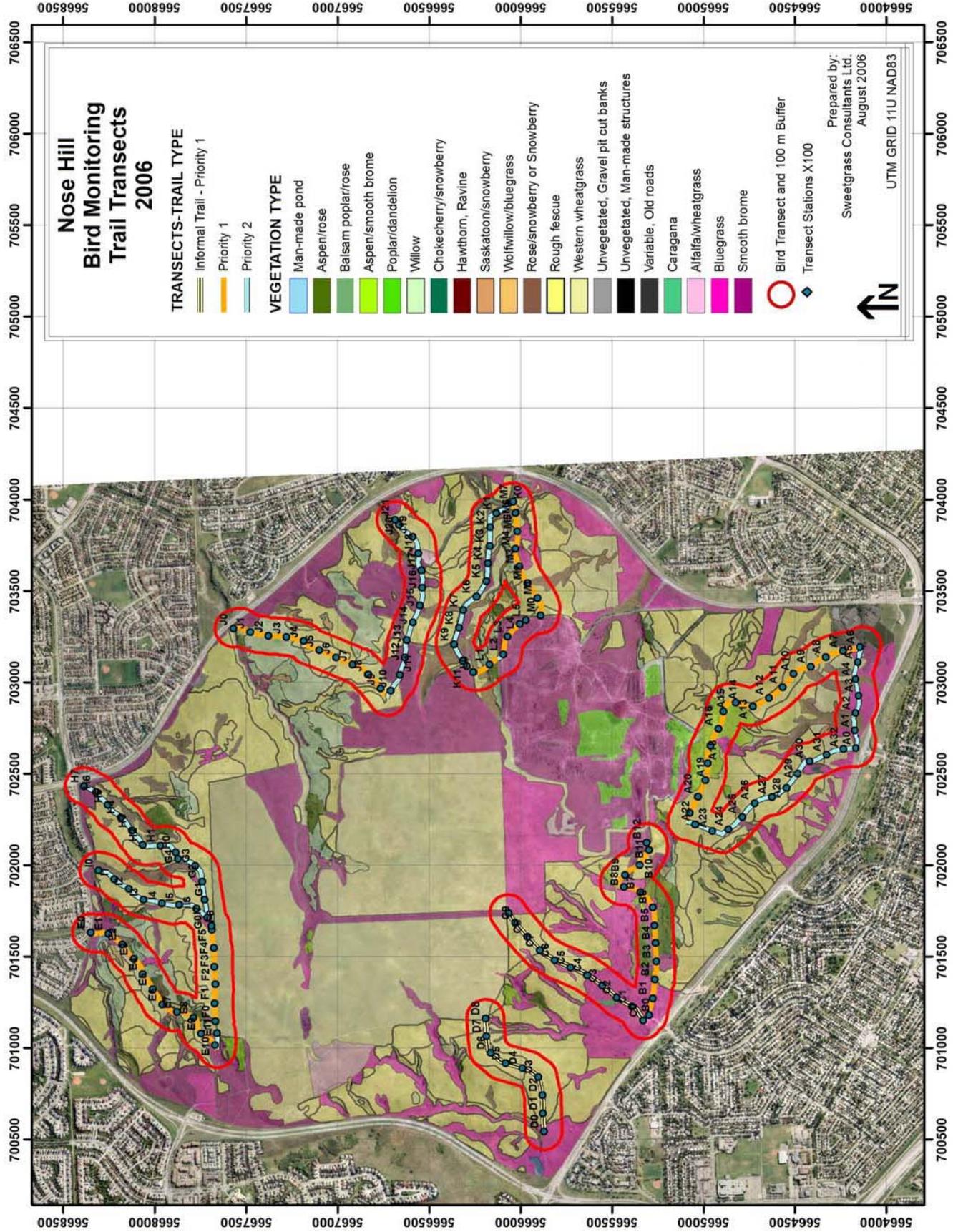
The objectives of this study were:

1. documentation of birds nesting and foraging in proximity to pathways and trails;
2. analysis of results (with particular attention to potential effects of pathway construction on breeding birds); and
3. formulation of recommendations for mitigating trail and pathway construction activities.

## **3. WORK PLAN AND METHODS**

The study methodology included the following:

- linear transect routes were selected by Parks staff and the consultant along representative and high priority pathways and trails, and, where possible, in the vicinity of circular bird plots.
- a total of 13 linear transect routes in 6 areas of the Park were selected.
- transect routes and individual stations were mapped in ArcGIS (see Nose Hill Bird Monitoring Transects Map on next page) and UTM's of individual stations were recorded (see Appendix 1).
- each route was walked four times, between sunrise and 10:00 a.m., on June 25 & 26, and July 5 & 20; the first three surveys were conducted at the same time as circular bird plots.
- all singing and non-singing birds observed were recorded in two zones: ON-LINE (within 5m on either side of the pathway or trail) and OFF-LINE (within 100 m on either side of the pathway or trail).
- observations were entered into a database and included information on species, location, date, time, habitat, observer, age/sex, behavior (singing, calling, flying etc.), and relevant notes.



# Nose Hill Bird Monitoring Trail Transects 2006

## TRANSECTS-TRAIL TYPE

- Informal Trail - Priority 1
- Priority 1
- Priority 2

## VEGETATION TYPE

- Man-made pond
- Aspen/rose
- Balsam poplar/rose
- Aspen/smooth brome
- Poplar/dandelion
- Willow
- Chokecherry/snowberry
- Hawthorn, Ravine
- Saskatoon/snowberry
- Wolfwillow/bluegrass
- Rose/snowberry or Snowberry
- Rough fescue
- Western wheatgrass
- Unvegetated, Gravel pit cut banks
- Unvegetated, Man-made structures
- Variable, Old roads
- Caragana
- Alfalfa/wheatgrass
- Bluegrass
- Smooth brome

- Bird Transect and 100 m Buffer
- Transect Stations X100

Prepared by:  
Sweetgrass Consultants Ltd.  
August 2006



UTM GRID 11U NAD83

## 4. RESULTS AND ANALYSIS

### 4.1 Overall Summary

A total of 34 species of birds were observed on the linear transect surveys. Of this total, 12 were observed in close proximity to (within 5 m of) a pathway or trail, and only 3 of these species were found frequently.

It was not the intent of this study to analyze habitat use for all species and habitats along the linear transects. However, the pertinent information (e.g. habitat, behavior etc.) is in the electronic database and could be analyzed if so desired. Intent of the 2006 linear bird transect data gathering was to determine what impacts, if any, that trail and pathway construction could have on nesting birds.

A printout of all linear bird transect observations in the electronic database is presented as file material for this study.

### 4.2 Breeding Birds in Proximity to Proposed Trail Redevelopment

The following species were observed in close proximity to pathways and trails--all 12 species nested in the Park in 2006. Behavior is noted for each species; family groups and singing indicate probable nesting in the general area and possibility of nesting near the trail. Flying birds (i.e., not in the habitat) were not included:

#### Species Infrequently Occurring Along Trails

American Goldfinch (including singing)  
Black-billed Magpie (foraging along trail edges)  
Brewer's Blackbird (possible nest)  
Cedar Waxwing (perched/feeding in shrubbery)  
Gray Partridge (included a family group)  
House Wren (singing)  
Le Conte's Sparrow (singing)  
Lincoln's Sparrow (family group and singing)  
Ring-necked Pheasant (flushed from trail edge)  
Vesper Sparrow (included singing birds and family groups)

#### Species Frequently Occurring Along Trails

American Robin (foraging) – 13 records (including foraging on trails)  
Clay-colored Sparrow (singing birds and family groups) – 61 records (included singing birds and family groups/nests)  
Savannah Sparrow – 142 records (included singing birds and family groups/nests)

Both groups of species above are widespread in Alberta and are not particularly sensitive to disturbance. The two most frequently encountered species on the linear transects, Clay-colored Sparrow and Savannah Sparrow, are the most abundant birds in the Park. Of the 12 species observed, only one, the Vesper Sparrow, is a species of concern in the Park because of declining numbers observed through circular plot surveys, from 1993 to 2006.

Areas where birds were most frequently observed in close proximity to trails included trees and shrubs (individual or patches) and trails with dense vegetation along narrow paths.

While there were numerous observations of adults giving alarm calls near nests or young, based on the researchers' experience, nests within 5 meters of busier trails would be unlikely because of the disturbance factor or human activity. Activity in these areas appeared to be mainly family groups (adults and young) moving about after young had left the nest.

## **5. SUGGESTED TRAIL AND PATHWAY CONSTRUCTION MITIGATION**

If trail or pathway construction is undertaken during the breeding season (roughly from May 1 to August 1) without applying suggested mitigation measures there is a possibility of destroying nests or young, albeit a relatively low possibility based on recent plot and transect surveys that demonstrated overall low populations of nesting birds in Nose Hill Park.

### **5.1 Potential Impacts**

#### **5.1.1 Overall**

Since no rare or sensitive species were observed in close proximity to trails and pathways during linear transect surveys, and only a relatively low density of nests are predicted in close proximity to trails and pathways, it is expected that the overall impact of trail and pathway construction on bird populations will be minimal.

#### **5.1.2 Along Existing Major Routes**

Based on field observations, it is expected that construction activities along major Park desire lines, which include routes with minimal vegetation cover, compacted soil, and broad widths of disturbances, would have a low probability of impacting nesting species—it is predicted that very few birds nest directly along these routes.

#### **5.1.3 Along Existing Minor Routes**

Minor trails in the Park, with lush vegetation, narrower width of disturbance, and less human activity, are more likely than major trails to have nesting birds in the immediate vicinity. Construction at these sites would, therefore, have a higher probability of impacting nesting species, when compared with major routes; however, the density of nesting species is still predicted to be relatively low compared with habitat at greater distance from the trails.

### **5.2 Suggested Mitigation Strategies**

Since construction of major park routes (including cross-park pathways and the upper plateau route) may require the duration of an entire construction season (May-October) to complete, and, in the case of the chip-seal treatment on the asphalt pathways, may require the majority of work to be completed prior to August 15 to meet specifications, mitigation strategies have been developed to largely reduce the direct impacts of construction on breeding birds. Mitigation strategies have been developed specifically for routes through the Park's grassland/shrubland

communities and woodland communities.

### **5.2.1 Grassland/Shrubland Routes**

If construction is to begin between May 1 and July 31:

1. Mow grass and clear/prune shrubs immediately along trail or pathway routes to eliminate available habitat for nesting birds.
2. Carry out the mowing and clearing of the route prior to the establishment of early nests (May 1).
3. The mow and clearing width should be 3 m, or the zone for construction activity (surface disturbance, machine/worker traffic area, temporary public access), whichever is greater.
4. Only above-ground clearing of shrubs is required—root clearing may be undertaken during actual trail operations.
5. The zone of disturbance through large patches of native vegetation should be minimal, which will necessitate that smaller scale machinery be used, where possible.

### **5.2.2 Many Owls Valley – Woodland**

If construction is to begin between May 1 and July 31:

1. Commence construction activities, including vehicle traffic, in Many Owls Valley prior to May 1 to avoid sensory disturbances to species establishing nests in the woodland.
2. If construction activities in Many Owls Valley do not commence prior to May 1, no construction activities would be permitted within a 100m radius from the aspen woodland until August 1.

It should be noted that The City of Calgary Parks, Emergency Medical Services (EMS), Police and Fire vehicles make use of the Many Owls Valley access road on an intermittent and as-needed basis for year-round access into the park. The intent of this mitigation measure is not to restrict current City access practices, since it is not expected that intermittent use of the site would have the same potential impact that continuous construction traffic could have.

### **5.2.3 Nest Searches**

If the above mitigation measures for grassland/shrubland routes and the Many Owls Valley Woodland are not implemented prior to May 1, the following mitigation measures should be employed:

Grassland/Shrubland:

1. Conduct nest searches immediately before mowing and clearing activities and/or the start of trail construction activities along grassland/shrubland routes after May 1.
2. If active nests are discovered, avoid the area until after the young have fledged. Construction should proceed as soon as possible after an area has been assessed as being free of nesting birds.
3. The following are guidelines for the timing of nesting activities for prospective nesting species that frequently occur along park trails:
  - Clay-colored Sparrow – 10-11 days (incubation) + 7-9 days (in nest) = 20 days approx. maximum nesting period

- Savannah Sparrow – 11-13 days (incubation) + 9-13 days (in nest) = 26 days approx. maximum nesting period

#### Many Owls Valley - Woodland

1. Prior to construction in the Many Owls Valley woodland habitat, conduct searches for nests of birds of prey (species sensitive to disturbance from human activity during the nesting season) within 100 m of route. Potential nesting species include Cooper's Hawk, Sharp-shinned Hawk, Merlin, Northern Harrier, Great-horned Owl, and Long-eared Owl, but other species should also be watched for.
2. While only two of these species, Cooper's Hawk and Northern Harrier, nested in the Park in 2006, the others either have been documented nesting in the past or were observed in the Park in 2006 and suitable nesting habitat exists. Based on information from 2006 bird surveys, the probability for most of these species to be nesting in the Park is relatively low; however, because bird surveys in 2006 were not initiated until early June, some early-nesting species could have been missed.
3. Searches for birds of prey would include diurnal surveys, as well as nocturnal calling surveys for owls.
4. Construction activity within 100 m of active bird of prey nests should be delayed until after the young have fledged.
5. The following are guidelines for the timing of nesting activities for prospective nesting species:
6. The following are guidelines for the timing of nesting activities for sensitive birds of prey:
  - Cooper's Hawk – 36 days (incubation) + 30-34 days (in nest) + 10 days (young return to nest for food) = 70 days approx. maximum nesting period
  - Swainson's Hawk – 26 days (incubation) + 28-35 days (in nest) = 61 days approx. maximum nesting period
  - Northern Harrier – 29-39 days (incubation) + 37 days (in or near nest) = 76 days approx. maximum nesting period
  - Merlin – 28-32 days (incubation) + 25-30 days (in nest) = 62 days approx. maximum nesting period.

## APPENDIX 1. LOCATION OF LINEAR BIRD TRANSECTS

### UTM COORDINATES

Note that an electronic waypoint file has been provided to facilitate uploading to GPS units.

DATUM NAD83

GRID 11U

STATION	GRID	EAST	NORTH
A0	11U	702639	5664165
A1	11U	702737	5664172
A2	11U	702831	5664166
A3	11U	702927	5664150
A4	11U	703016	5664168
A5	11U	703109	5664153
A6	11U	703191	5664142
A7	11U	703171	5664237
A8	11U	703138	5664331
A9	11U	703085	5664413
A10	11U	703046	5664506
A11	11U	702973	5664565
A12	11U	702913	5664641
A13	11U	702867	5664730
A14	11U	702889	5664822
A15	11U	702840	5664889
A16	11U	702745	5664918
A17	11U	702652	5664962
A18	11U	702557	5664977
A19	11U	702464	5664988
A20	11U	702374	5665030
A21	11U	702285	5665073
A22	11U	702223	5665044
A23	11U	702186	5664951
A24	11U	702196	5664862
A25	11U	702263	5664787
A26	11U	702339	5664720
A27	11U	702372	5664625
A28	11U	702422	5664545
A29	11U	702500	5664483
A30	11U	702567	5664420
A31	11U	702605	5664327
A32	11U	702635	5664234
B0	11U	701180	5665297
B1	11U	701272	5665276
B2	11U	701375	5665265
B3	11U	701473	5665256
B4	11U	701575	5665261
B5	11U	701671	5665266

B6	11U	701770	5665276
B7	11U	701850	5665344
B8	11U	701882	5665434
B9	11U	701946	5665429
B10	11U	702001	5665347
B11	11U	702084	5665297
B12	11U	702124	5665309
C0	11U	701151	5665328
C1	11U	701226	5665390
C2	11U	701276	5665474
C3	11U	701341	5665552
C4	11U	701398	5665634
C5	11U	701440	5665724
C6	11U	701480	5665812
C7	11U	701534	5665895
C8	11U	701609	5665962
C9	11U	701684	5666028
C10	11U	701737	5666065
D0	11U	700543	5665870
D1	11U	700642	5665876
D2	11U	700743	5665879
D3	11U	700842	5665902
D4	11U	700890	5665988
D5	11U	700916	5666081
D6	11U	700974	5666163
D7	11U	701064	5666186
D8	11U	701162	5666192
E0	11U	701632	5668348
E1	11U	701625	5668252
E2	11U	701566	5668176
E3	11U	701488	5668112
E4	11U	701404	5668064
E5	11U	701321	5668011
E6	11U	701237	5667959
E7	11U	701196	5667879
E8	11U	701166	5667787
E9	11U	701079	5667745
E10	11U	701017	5667669
E11	11U	701082	5667658
F0	11U	701146	5667666
F1	11U	701244	5667671
F2	11U	701348	5667668
F3	11U	701445	5667674
F4	11U	701548	5667676
F5	11U	701647	5667685
F6	11U	701667	5667688
G0	11U	701713	5667708
G1	11U	701810	5667725
G2	11U	701911	5667740
G3	11U	701997	5667777

G4	11U	702034	5667871
H0	11U	702070	5667884
H1	11U	702107	5667968
H2	11U	702110	5668064
H3	11U	702188	5668123
H4	11U	702261	5668184
H5	11U	702330	5668254
H6	11U	702398	5668319
H7	11U	702431	5668384
I0	11U	701971	5668306
I1	11U	701924	5668220
I2	11U	701869	5668140
I4	11U	701792	5667960
I5	11U	701784	5667864
I6	11U	701762	5667770
I3	11U	701812	5668059
I7	11U	701711	5667712
J0	11U	703293	5667569
J1	11U	703275	5667476
J2	11U	703253	5667378
J3	11U	703246	5667279
J4	11U	703226	5667184
J5	11U	703174	5667100
J6	11U	703136	5667008
J7	11U	703097	5666916
J8	11U	703042	5666833
J9	11U	702966	5666764
J10	11U	702954	5666710
J11	11U	703041	5666659
J12	11U	703134	5666631
J13	11U	703230	5666621
J14	11U	703326	5666588
J15	11U	703420	5666549
J16	11U	703516	5666536
J17	11U	703612	5666542
J18	11U	703704	5666558
J19	11U	703796	5666589
J20	11U	703862	5666664
J21	11U	703887	5666687
K0	11U	703985	5666054
K1	11U	703925	5666132
K2	11U	703847	5666166
K3	11U	703745	5666169
K4	11U	703649	5666179
K5	11U	703552	5666187
K6	11U	703468	5666241
K7	11U	703394	5666311
K8	11U	703298	5666335
K9	11U	703206	5666361
K10	11U	703117	5666312

K11	11U	703090	5666292
L0	11U	703055	5666256
L1	11U	703097	5666170
L2	11U	703153	5666094
L3	11U	703249	5666071
L4	11U	703319	5666002
L5	11U	703339	5665969
M0	11U	703365	5665889
M1	11U	703460	5665906
M2	11U	703543	5665961
M3	11U	703632	5666005
M4	11U	703730	5666027
M5	11U	703824	5666017
M6	11U	703926	5666027
M7	11U	703986	5666038