Final Report

Sustainable Design of Concrete Bus Pads to Improve Mobility in Baltimore City

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16. Abstract

Public transit, particularly buses in Baltimore City, plays a vital role in sustainable transportation in the United States as well as providing mobility to those without cars. Bus pads are usually constructed in the street, adjacent to a bus zone, to accommodate the weight of a bus. Bus pads are highly durable areas of the roadway surface at bus stops, usually made of concrete, addressing the common issue of asphalt distortion at bus stops. These concrete slabs bear the burden of the daily stream of buses better than asphalt. The major problem with the asphalt bus pads is shifting asphalt creating waves or ripples under buses' weight, and when asphalt shifts, it cracks and can create potholes. Roadway pavements need to be strong enough to accommodate repetitive bus axle loads. Exact pavement designs will depend on site specific soil conditions. Areas where buses start, stop, and turn will be of particular concern for pavement design. Concrete pavement is desirable in these areas to avoid the failure problems that are experienced with asphalt. Concrete bus pads should be constructed based on the bus service frequency and type of transit vehicle used. However, if the concrete bus pad is not properly designed, it will encounter different problems with serviceability and strength of the slab.

During a case study in Baltimore City that was used to collect preliminary data for the proposed research, it was observed that most of the concrete bus pads require more than regular routine maintenance due to surface cracks and local failure, resulting in major replacement costs for Baltimore City. Lack of appropriate load identification and definition of critical load scenarios for the appropriate design of the concrete bus pad were noted as shortcomings in addition to the design assumption of uniform distribution of soil pressure under the concrete slab, which was not the case noted in the field.

This research carried out a field study and extracted two concrete strips in longitudinal and transvers axis from a bus pad in Baltimore. The concrete strips were tested at the Structures

Laboratory of Morgan State University, under a four-point bending produced by two concentrated monotonic loads. The load and deflection were measured using precise instruments including LVDTs and load cells to investigate the concrete strips' performances under the applied load until failure. All load cases and combinations were identified and determined based on possible loading scenarios. A numerical model was developed and soil-structure interaction was studied using the Winkler method. The maximum design forces and moments were extracted from the FE model, which considers the effect of moving loads on a two-way slab as well as the temperature. This research evaluated the load-bearing capacity of the current design of Baltimore bus pads and compared it to the tested strips as well as the required bending capacity of FE models. Results show that both design and construction of bus pads in Baltimore need to be modified. In conclusion, design and construction recommendations were proposed to enhance bus pads' life span in Baltimore City to address the current issues and reduce maintenance costs.

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Contents

Executive Summary

Public transit, particularly buses in Baltimore City, plays a vital role in sustainable transportation in the United States as well as providing mobility to those without cars. Bus pads are usually constructed in the street, adjacent to a bus zone, to accommodate the weight of a bus. Bus pads are highly durable areas of the roadway surface at bus stops, usually made of concrete, addressing the common issue of asphalt distortion at bus stops. These concrete slabs bear the burden of the daily stream of buses better than asphalt. The major problem with the asphalt bus pads is shifting asphalt creating waves or ripples under the bus' weight, and when asphalt shifts, it cracks and can create potholes. Roadway pavements need to be strong enough to accommodate repetitive bus axle loads. Exact pavement designs will depend on site specific soil conditions. Areas where buses start, stop, and turn will be of particular concern for pavement design. Concrete pavement is desirable in these areas to avoid the failure problems that are experienced with asphalt. Concrete bus pads should be constructed based on the bus service frequency and type of transit vehicle used. However, if the concrete bus pad is not properly designed, it will encounter different problems with serviceability and strength of the slab, resulting in cracking and the need for either repair or replacement, which has been the current outcome for Baltimore City.

It was observed that **most of the concrete bus pads require more than regular routine maintenance due to surface cracks and local failure**, resulting in major replacement costs for Baltimore City. A lack of appropriate load identification and definition of critical load scenarios for the appropriate design of the concrete bus pad were noted as shortcomings, in addition to the design assumption of uniform distribution of soil pressure under the concrete slab, which was not the case noted in the field. Therefore, the ***main objectives*** of the proposed research are to: 1) experimentally test the current designed bus pad (strip) and identify the causes of concrete surface cracks by comparing the results with finite element models, 2) recommend appropriate design criteria for immediate deployment of newly designed bus pads based on experimental test data from in-situ bus pads (strips) retrieved from the field prior to a replacement job, which can also be expanded for implementation in other urban areas to support sustainable transportation infrastructure design. Implications from this study have the potential to not only improve urban mobility but also serve as a baseline approach toward sustainable infrastructure design to support

the development of smart cities that may rely on wireless sensor networks embedded within transportation infrastructure elements like concrete bus pads.

1. Motivation and Background

The Maryland Transit Administration (MTA) operates a comprehensive transit system throughout the Baltimore-Washington Metropolitan Area with a daily ridership of 380,100 people and an annual ridership of 112,528,100 people. There are 80 bus lines with 842 buses serving Baltimore's public transportation needs, along with other services that include the Light Rail, Metro subway, and MARC train. With nearly half the population of Baltimore residents lacking access to a car, the MTA is an important part of the regional transit picture [1]. Therefore, having durable infrastructure to support the bus transit system and mobility of its users is critical, especially for Baltimore City. Crumbling bus pads where the buses stop to pick up riders are problematic; there is a need to investigate the cause of the cracking and develop a more sustainable design approach so that bus pads are not replaced as often, which would in turn reduce costs and disruptions to service.

Bus pads are highly durable areas of the roadway surface at bus stops, usually made of concrete, addressing the common issue of asphalt distortion at bus stops. Conventional asphalt pavement is flexible, and can be moved by the force and heat generated by braking buses and trucks, leading to wave-shaped hills or hummocks along the length of a bus stop. This issue is pronounced at high-volume stops where idling buses further heat the roadway surface, as well as near-side stops in mixed-traffic lanes where trucks may be adding to wear and tear.

Bus stops' concrete slabs bear the burden of the daily stream of buses better than asphalt. If asphalt is used rather than concrete for the 10-foot by 60-foot rectangles, then the asphalt shifts and creates waves or ripples under the buses' weight, and when asphalt shifts, it cracks and can create potholes. Moreover, compared to asphalt, concrete is stronger, longer-lasting, and reflective at night, which helps distinguish the bus stops. But if concrete is so much better at handling use and weight, why not pave all roads with concrete? The main reasons are: 1) concrete is far more difficult to repair, and 2) concrete costs more than asphalt; however, the latter cannot be applicable in countries whose oil products prices are higher. In pavement design, asphalt is called flexible pavement, which generally consists of a thin layer spread over a gravel or stone base and sub-base, and all these layers rest over compacted soil. When a large weight such as a bus or heavy vehicle rests on the asphalt pavement, or when the pavement is subjected to break forces, the bottom layers including base, sub-base and compacted soil can shift. In contrast, concrete that is used as rigid pavement may or may not have a base course between the pavement and subgrade. When a large weight rests on concrete, the weight is distributed over a relatively wide area of the subgrade. However, since concrete's surface is thicker than asphalt, repairing concrete requires replacing the entire road, whereas repairing asphalt requires only scraping off the top surface and relaying a new surface.

Cracks and damage in concrete pavement occur as a result of shrinkage, settlement, uplift, excessive weight atop the slab, etc. When the existing concrete pavement develops gaps, cracks, chips, displacement, holes, or other defects, permanent repair or replacement of the concrete pavement is required in order to maintain defect-free pavement and provide a safe public environment. Reinforcement should be used in concrete bus pads to control cracks, damage, and produce aggregate interlock, which helps to keep the cracked sections close together so that the slab will act as a unit and transfer loads across a crack.

2. Literature Review

This research identifies surface cracks and damage of concrete bus pads occurring under the existing design in Baltimore through numerical and experimental investigations in order to address the current design and construction issues and provide recommendations for repairing existing and designing new bus pads. The surface cracks and damage in concrete pavements are among the major problems of concrete pavements and have been studied from different aspects. A list of previous research is provided in this section:

Concrete Pavement Crack Control and Prevention:

Oh et al. [2] investigated movements of transverse crack width of the continuously reinforced concrete pavement (CRCP) subjected to environmental loads such as changes in temperature. To this end, in-situ experiments were carried out at several highway CRCP sections. The crack width movements were analyzed along the vertical, transverse and longitudinal directions to comprehensively understand the crack width behaviors of CRCP. The effects of design-related variables, such as steel ratio and base layer type, and performance-related variables, such as crack spacing and crack occurrence time, on crack width movements were evaluated. Based on the findings from this comprehensive experimental study concerning crack widths, suggestions were proposed to improve the performance of CRCP as below:

- The crack width movements are the largest at the top of concrete slab and inversely proportional to the slab temperature variations. The crack width movements at different slab depths are mainly dependent on the temperatures at the top of slab, and the time lags in the crack width movements along the slab depth cannot be observed as can be seen in the slab temperatures.
- The crack width movements are affected by the longitudinal location. Those are larger near the free end terminals than at the central section of the CRCP. Very little differences in the crack width movements are observed along the transverse direction (along the crack).
- The crack width movements tend to become larger as the crack spacing increases and are mostly affected by the crack spacing when the crack occurred, instead of the current crack spacing.
- The crack width movements are affected by the crack occurrence time as well. Even though the crack spacings are currently similar, the crack width movements would be larger at the cracks that occurred in the early age of the pavement.
- Both the crack openings and temperature drops are generally larger in the summer. However, the crack openings per unit temperature drop in the summer and winter are very similar. Therefore, the crack width movements are dependent mainly on the amount of temperature change regardless of seasons.
- The type of base layer beneath the concrete slab affects the crack width movements and the CRCP with an asphalt bond breaker layer reveals larger crack width movements compared to the CRCP with a lean concrete base.
- The crack width movements tend to increase as the longitudinal steel ratio becomes smaller.

Xiao and Wu [3] studied the longitudinal cracking of jointed plain concrete pavements in Louisiana through a field investigation and numerical simulation. They believe that the current pavement design guide does not directly consider longitudinal cracking in concrete pavement. However, longitudinal cracking has been widely observed on joint plain concrete pavements, and sometimes is deemed even more significant than transverse cracking, which adversely affects the performance and service life of concrete pavements. They investigated the possible causes for the longitudinal cracking problem in joint plain concrete pavements, and their results confirmed that construction problems such as inadequate longitudinal joint formation and inadequate base support are among the contributing factors, in particular for premature and localized longitudinal cracks. The field survey indicated that the amounts of longitudinal cracking increased with widened slabs and tied concrete shoulders. Results from numerical simulation further demonstrated that the geometry of a slab could greatly influence the potential of longitudinal cracking, especially when the traffic is composed of more tandem and tridem axles. They developed an empirical model based on the field data to predict the longitudinal cracking in concrete pavements.

Liu et al. [4] performed a comparative study on cracking and its associated factors of continuously reinforced concrete pavement. They focused on the punchout, one of the main failure modes of continuously reinforced concrete pavement, which is closely related to concrete cracking, the form and distribution pattern of pavement crack. The paper studies the influence of temperature and humidity on the continuously reinforced concrete pavement cracking conditions of the test-road, and the application of continuously reinforced concrete pavement in the tunnel and outside, by investigating the crack development. It is found that the daily temperature difference is 2 degree centigrade in the tunnel, and the annual temperature difference and humidity are 8.9% and 75% ~ 85%, respectively. Temperature during the construction, and curing temperature and humidity of continuously reinforced concrete pavement greatly influences the crack occurrence. Cracks outside the tunnel occur more and with more concentrated distribution in the early stage. Crack distribution in the tunnel is more reasonable. After eight months that include a winter, the crack number increased significantly outside, while the spacing was wider and the width was smaller in the tunnel. Results show that appropriate temperature and humidity can guarantee a more successful cement road application, continuously reinforced concrete pavement crack form is more reasonable, performance in the crack width is small, and the spacing is big, which reduces the possibility of punchout and spalling.

Choi et al. [5] conducted research identifying horizontal cracks or delamination in concrete pavement and bridges. Since more concrete structures and pavements in the U.S. are approaching or have already exceeded their design lives, the number of distresses and needed repairs have increased, along with the amount of funding needed. In this study, various concrete distresses in structures and pavements were evaluated with MIRA testing, which is based on the ultrasonic pulse-echo method. The distresses evaluated included horizontal cracking or delamination at the mid-depth of concrete pavement slabs, spalling and map cracking in concrete pavement slabs, mudballs in concrete runways, concrete cracks and delamination in bridge columns, and shallow concrete cover in bridge piers. MIRA was able to detect discontinuities in concrete, whether they are cracks, delamination at an interface of two concrete slabs, mudballs, or reinforcing steel.

Rigid Pavement Settlement:

Combrinck et al. [6] investigated the influence of concrete depth and surface finishing on the crack of plastic concrete. Settlement and shrinkage cracking occur in plastic concrete once cast up to and around the final setting time. Combrinck et al. reported on the influence of element depth and surface finishing operations on the cracking of plastic concrete. Deeper concrete elements are shown to have less severe shrinkage cracking when no settlement cracking is present, while when combined with settlement cracking at similar cover depths, the cracking is more severe in deeper concrete. Surface finishing operations are shown to only close the surface of plastic cracks and not the crack below the surface, therefore temporarily hiding the true severity of the cracking.

Combrinck et al. [7] also performed research on the interaction between settlement and shrinkage cracking in plastic concrete. The plastic period in conventional concrete is dominated by two volume changes, namely, plastic settlement and plastic shrinkage, which if restrained can result in cracking. Although both volume changes and the resulting cracking have been well documented, cracking during the plastic period remains a problem. One reason is the complex interaction between these cracks. This research showed the necessity of considering the combined effect of plastic settlement and plastic shrinkage cracking when investigating the cracking of plastic concrete. This is achieved by isolating both cracking types individually, followed by the interaction between these cracks. Plastic settlement cracking shows multiple tensile surface cracks and shear-induced cracks below the surface. Plastic shrinkage cracking shows a single well-defined crack pattern which forms suddenly throughout the entire depth of the concrete. When combined, significant crack widening can occur long before normally expected due to the negative synergy between these two crack types.

Effect of Additives and Fibers on Enhancing Crack Resistance:

Boikova et al. [8] conducted a series of tests and used two additives simultaneously to increase crack resistance and tensile strength in bending and decrease abrasion. A complex admixture, based on a mix of polycarboxylate polymers modified by inorganic substances including nanostructure elements $SiO2 \times nH2O$ which are parts of silicic acid, was developed as an admixture of polyfunctional action (activating and plasticizing actions). Concrete with these two additives used in rational quantities is characterized by a 58%-59% increase of compressive strength and an 83%-91% increase of tensile strength in bending, with the coefficient of crack resistance rising by 17%-20% [8].

Yang et al. [9] studied the benefits of using amorphous metallic fibers in concrete pavement for long-term performance. This study aims to examine the implications of amorphous metallic fibers on the mechanical and long-term properties of concrete pavement. Two different amounts of amorphous metallic fibers were incorporated into concrete, and plain concrete without fibers was also adopted for comparison. Test results indicated that including the fibers improved the overall mechanical properties of concrete, and the improvement increased when a higher amount of fibers was used. In particular, the equivalent flexural strength and flexural strength ratio were substantially improved by incorporating the amorphous metallic fibers. This may enable the thickness of airfield concrete pavement to decrease. Adding amorphous metallic fibers also improved the resistance to surface cracking of concrete pavement by repeated wheel loading. In addition, by adding 5 kg/m^3 and 10 kg/m^3 amorphous metallic fibers in concrete pavement, roughly 1.2 times and 3.2 times longer service life was expected, respectively, as compared to their counterpart, plain concrete. Based on a life cycle cost analysis, the use of amorphous metallic fibers in concrete pavement was effective at decreasing the life cycle cost compared to plain concrete pavement, especially for severe traffic conditions.

Smirnova et al. [10] researched the influence of polyolefin fibers on the strength and deformability properties of road pavement concrete. In this study the influence of the type and quantity of polyolefin fibers on the strength properties (compression strength, tensile strength in bending, strength in uniaxial tension), the deformation properties (elastic modulus, Poisson's coefficient) and the abrasion resistance of cement concrete with water-to-cement ratios within 0.31-0.55 were stated in the paper. The ways of introducing fibers into fresh concrete were investigated. The method of introduction and mixing procedure were shown to improve the uniform distribution of fibers in fresh concrete. The increase of the bending tensile strength and the uniaxial tensile strength of concrete with fibers in comparison with the reference concrete was observed with the water-to-cement ratio decrease. The increase of uniaxial tensile strength at age 28 days for concrete with macrofibers in the amount of 4.5 kg/m^3 was 23% and 29%; for macrofibers in the quantity of 3 kg/m^3 it was 19% and 26% with a water-cement ratio equal to 0.49 and 0.31, respectively. The maximum reduction of abrasion in the range of 7.5%-10% was observed in concrete with water-to-cement ratios within 0.44-0.55 for all investigated types of fibers. The influence of fibers on the concrete abrasion with lower w/c ratio was negligible. The results can contribute to the rational use of modified polyolefin fibers in road pavement concrete.

Alsaif et al. [11] investigated the mechanical performance of steel fiber reinforced rubberized concrete for flexible concrete pavements. This work aims to develop materials for flexible concrete pavements as an alternative to asphalt concrete or polymer-bound rubber surfaces and presents a study on steel fiber reinforced rubberized concrete (SFRRuC). The main objective of this study is to investigate the effect of steel fibers (manufactured and/or recycled fibers) on the fresh and mechanical properties of rubberized concrete (RuC) comprising waste tire rubber (WTR). Free shrinkage is also examined. The main parameters investigated through 10 different mixes are WTR and fiber contents. The results show that the addition of fibers in RuC mixes with WTR replacement substantially mitigates the loss in flexural strength due to the rubber content (from 50% to 9.6% loss, compared to conventional concrete). The use of fibers in RuC can also enable the development of sufficient flexural strength and enhance strain capacity and post-peak energy absorption behavior, thus making SFRRuC an ideal alternative construction material for flexible pavements.

Mehta et al. [12] conducted research on filled cracking performance of rigid pavements. They tested pavements of three different flexural strengths as well as two different subgrades, a soft bituminous layer and a more rigid layer known as econocrete. In addition, cracking near two types of isolated transition joints, a reinforced edge joint and a thickened edge joint, was considered. A moving load was used to test the pavement sections and the researchers determined that the degree of cracking was reduced as the flexural strength of the pavement was increased and fewer cracks formed over the econocrete base than over the bituminous base. In addition, the thickened edge transition joint was more effective in preventing cracking at the edges compared to the reinforced edge joint.

A number of studies have been carried out to provide a guideline for bus stops in the United States by state DOTs and local agencies [13] [14] [15] [16] [17] [18] [19]; however, only a few of them include the concrete bus pad design in the design guidelines.

3. Problem Statement and Research Objectives

Although replacing asphalt pavement with concrete pads for bus stops has improved the pavement performance under cyclic loads and break forces of buses, the concrete pads' deterioration and surface cracks have been increasingly reported in Maryland and Baltimore. This issue has become more serious due to significant increases in maintenance costs year over year. In order to address this issue and enhance the current concrete bus pad design, this research employs experimental and numerical methods to analyze and design the concrete bus pads in Baltimore under critical loads. The main objectives are to 1) identify critical loading scenarios, 2) evaluate the structural response, assessing deficiencies, and 3) present recommendations to enhance the current design and propose a new design for concrete bus pads in Baltimore.

Figure 1. Field location and problem observation, (a) location of taking the field samples, (b) surface cracks were observed on concrete bus pad designed for Baltimore City

4. Rigid Pavement Performance and Typology of Cracks

4.1. Performance Evaluation

Bus pads as a part of urban pavement play a vital role in infrastructure's sustainable development; however, in many cities they are in bad condition and perform poorly. The bus pads' defects can decrease the road safety and increase maintenance and transportation costs. Five (5) main factors were identified as reasons for bus pad deficiencies including:

1) Environment

2) Structure

3) Construction

4) Maintenance

5) Traffic

Bus pads deteriorate over time due to the effect of stresses caused by traffic and the environment. How a bus pad responds to these stresses will depend on the bus pad structure – such as material type, layers thickness and subgrade properties – and construction characteristics, including construction technologies, quality, and maintenance, such as treatments applied, timing, and methods.

Bus pad performance at a certain time of the service life can be characterized and assessed in terms of particular distresses or a combined index that represents the bus pad's overall condition. The factors involved in the determination of the bus pad condition are the material type and the distresses observed. In both cases, the performance indicator reflects the bus pad condition at a specific age of the pavement service life. It is important not only to understand the current condition of bus pads, but also how their condition will change over time.

For this reason, the effectiveness of maintenance treatments over time relies on making the decision based on the current bus pad condition and its performance model. In other words, a life cycle analysis of the bus pad should be performed. The typical cycle of deterioration of a bus pad, as a part of a pavement, comprises three stages [20], as shown in Figure 2. These stages are related to different types of maintenance:

- Slow Phase (Phase A on Figure 2): For several years the pavement experiences a slow deterioration process, particularly in the surface, and also, though to a lesser degree, the rest of its structure. The deterioration rate depends on the quality of the initial construction. To stop this process of deterioration it is necessary to apply, with some frequency, various maintenance treatments, mostly on pavement surface and drainage works. The group of these maintenance activities is defined as Preservation and should be performed as part of routine maintenance.
- Accelerated Phase (Phase B on Figure 2): After several years of use, the pavement enters a stage of accelerated deterioration. At the beginning of this phase, the basic structure of the pavement is still intact, the surface distresses are minor, and the common user has the impression that it still remains in good condition; however, it is not. Going further in phase B, more damage to the surface is observed and the basic structure begins to

deteriorate, which is not visible. These distresses begin as punctual, and slowly spread until eventually they affect most of the pavement surface. This phase is relatively short. Once the surface damage is widespread, destruction is accelerated. At the start of this phase reinforcing the pavement surface usually is sufficient, so maintenance is relatively low cost. Once a suitable reinforcement is applied, the pavement again is suitable for function and can withstand the traffic for many more years. This type of activity is defined as Functional Maintenance or simply Maintenance.

- Break Phase (Phase C on Figure 2): After the accelerated phase, the optimal intervention time passes, and the more the intervention is delayed, the greater the damage and the higher the repair cost. The damage that occurred in the basic structure of the road must be repaired, which means demolishing and lifting the damaged parts, replacing components with new ones and then reinforcing the road surface. This group of activities is frequently named Structural Maintenance or Rehabilitation, when it refers to the combination of partial repairs on the basic structure of the road and strengthening its surface.
- Decomposition Phase (Phase D on Figure 2): When no interventions are applied at any time in previous phases, the pavement reaches the point of breakdown, and failure is widespread for both the pavement surface and basic structure. Decomposition of the road is the last stage of its existence and can last several years. At this phase the only solution is the reconstruction of the pavement.

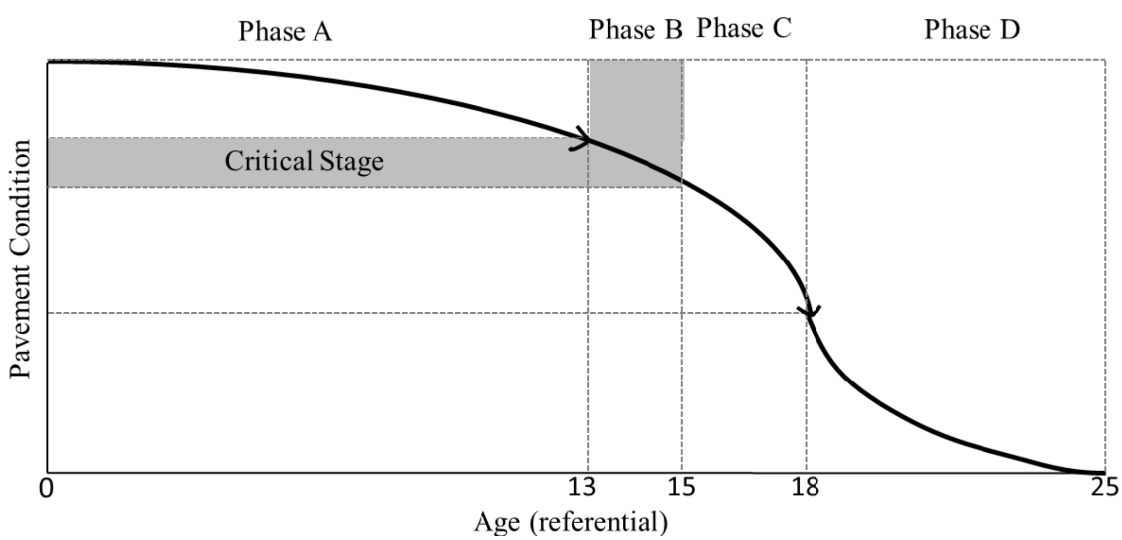


Figure 2. Pavement life cycle *[20]*

Based on the deterioration stages, it is essential to consider maintenance activities for each stage to optimize resources and extend the service life of pavement with a good condition. Thus, activities for preservation, maintenance and rehabilitation (P&M&R) need to be defined for application throughout bus pad service life.

4.2. Defects and Causes

Concrete bus pads are mainly considered as rigid pavement in design and repair methods, thus there are similar concerns in terms of defects and causes of defects. When it comes to the repair of distressed concrete pavements, few options are available. It is very difficult and time consuming to repair hardened concrete. Full-depth and partial-depth repair, slab replacement, crack sealing, crack stitching, and staple pinning are some of the techniques that can be used to repair distressed concrete pavements. The causes and repair techniques for these distresses are discussed as follows:

4.2.1. Settlement Cracks

Settlement of the subgrade and subbase can cause cracking of the concrete pavement. Cracks resulting from settlement of the subgrade are normally variable in direction but most commonly appear diagonally and extend continuously to many slabs. Repeated heavy truck loads may cause further breaking of the slabs into several pieces due to the loss of support beneath the slab. Locations with underlying pipe culvert and slab culvert are more prone to settlement cracking. Also, settlement of the subgrade and other pavement layers over pipe culverts and in the vicinity of slab culverts mainly during and after rainy seasons can cause full-depth cracking of overlying concrete slabs.

4.2.2. Shrinkage Cracking

Like all materials, concrete also expands and contracts with variations in temperature. Concrete shrinkage starts as it cures. The temperature and moisture gradient that exists between the top and bottom of the concrete pavement slabs causes the curling and warping of the slab. The natural response causes the concrete pavement to crack at regular intervals. A fundamental feature of concrete pavement is to introduce a jointing system to control the location of these expected cracks. Contraction joints are designed specifically for controlling the location of these types of cracks.

Figure 3. Concrete Shrinkage Cracking [21]

The contraction joint system assures crack control in new concrete pavement. However, certain design or construction factors may influence the effectiveness of a contraction joint system. Unexpected changes in the weather during and after construction can induce uncontrolled cracking despite the adoption of a proper jointing system. Because of the complexity of interrelated factors, uncontrolled cracks will occur in some concrete pavements. Theses cracks generally develop within the first 30 to 45 days.

4.2.3. Cracking in Construction Joints

Concrete slabs crack when tensile stresses within the concrete overcome the tensile strength. At early ages, the tensile stresses develop from restraint of the concrete's volume changes or slab bending from the temperature and moisture gradient through the concrete. Each transverse and longitudinal saw cut induces a plane of weakness where a crack will initiate and then propagate to the bottom of the slab. Uncontrolled cracking can be controlled by adopting the following precautionary measures:

There is an optimum time to saw contraction joints in new concrete pavements, which is defined as the sawing window. It represents a short period after the placement of concrete within which concrete can be cut successfully before it cracks in an uncontrolled manner. If the sawing of the joints is started too early then it may lead to raveling along the cut. The jagged, rough edges are termed as raveling. Some raveling is acceptable if the widening of the saw cut for filling joint sealant would remove the raveled edge. If the raveling is too severe, it will affect the appearance and ability to seal the joint. If the sawing of joints is delayed beyond a certain period when significant concrete shrinkage occurs then it may induce random cracks within the pavement.

The influence of the saw cut depth on early cracking primarily depends upon the time of sawing. Early sawing of the joints may require lesser saw-cut depths for preventing random cracking. Generally, the saw-cut depth is kept as 0.25 to 0.33 times the depth of the slab. If the depth of the saw-cut is less than the required depth then it may not sufficiently weaken the concrete at that location and it may ultimately lead to cracking elsewhere. This is also a very common type of crack propagation in bus pads as the length of the bus pad is usually much longer than the width; therefore, they always require construction joints in a transverse direction.

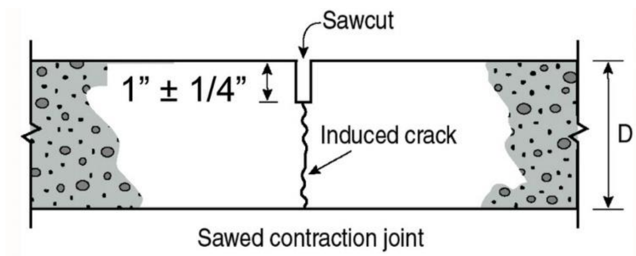


Figure 4. Sawcut induced crack

Furthermore, in terms of joint spacing, theoretical and practical studies have shown that the optimum joint spacing depends upon the slab thickness, concrete aggregates, subbase, and climate. Pavement with long transverse joint spacing may crack at locations other than the saw cuts due to tensile stresses from temperature curling.

Figure 5. Concrete joint spacing *[22]*

On the other hand, the temperature relates to the strength gain of the concrete and partly controls the time of initiating the saw cut and final time before the onset of cracking. The sawing of joints should be completed before the concrete surface temperature begins to fall since thermal contraction begins as soon as the concrete temperature falls.

Figure 6. Curing conditions *[23]*

The heat development profile of a concrete mix can be obtained by using concrete maturity meters. Monitoring of the concrete surface temperature will let us know the concrete strength and also the point when surface temperature begins to decline.

4.2.4. Weather and Ambient Conditions

The weather almost always has a role in the occurrence of uncontrolled cracking. Air temperature, wind, relative humidity, and sunlight all influence concrete hydration and shrinkage. These factors may heat or cool concrete or draw moisture from exposed concrete surfaces. Concrete paved in early morning will often reach higher temperatures than concrete paved during the late morning or afternoon because it receives more radiant heat. As a result, concrete paved during the morning will generally have a shorter sawing window, and often will exhibit more instances of uncontrolled cracking.

Plastic shrinkage cracking is a result of rapid drying of concrete pavement surface due to either a high ambient temperature, high wind velocity, low humidity or a combination of these factors. These cracks are generally tight and appear in the form of parallel groups perpendicular to the direction of the wind soon after the placement of concrete Adequate curing measures are necessary to prevent their occurrence.

4.2.5. Blowups

Blowups are compressive joint failures brought about by excessive expansion related to high temperatures, high moisture contents, or a combination of the two. Blowups may occur gradually or may be sudden and dramatic. Failures are full depth and full lane width and can present serious hazards to traffic. Blowups become likely when normal joint movement is restricted by infiltration. An increase in concrete volume brought about by elevated temperatures and moisture contents creates longitudinal thrust that may overcome the compressive strength of the weakest joint in the section. Blowup tendency is more pronounced on pavements with long slabs where individual joint movements are greatest. Joints typically fail in the lower portions first. This failure provides an inclined plane for the slabs to slide upward when further expansion occurs. A sudden and dramatic blowup can occur when the upper portion shears off with little or no warning. Most blowups occur during a significant hot spell and usually in the afternoon.

4.2.6. Cracks Over Dowel Bars

Fine hairline to moderately wide cracks may develop sometimes over the dowel bars. The length of the cracks may be as long as the length of the dowels. These cracks are mostly surface cracks with 25 mm to 40 mm depth from the slab surface. However, in some cases, these cracks may penetrate up to the surface of the dowel bars. These cracks may not affect the load transfer capacity of the dowel bar assembly, but gradually the spalling of these cracks may lead to deterioration of the slab surface over the dowel locations. Possible reasons for such cracks are too little or too much vibration of the dowel bar inserter unit, stiff concrete mix, shallow depth of dowel bars, and natural phenomenon of settling heavy solids in a liquid medium around dowels. Inadequate vibration of the DBI unit and stiff concrete mix may leave a dowel trail in which the concrete is not compacted properly. Subsequently concrete settles down within the trail and creates a crack over the dowel location. Too much vibration of the DBI unit may create segregation of aggregates in the dowel trail resulting in too much accumulation of slurry and water in the trail over the dowel. This may cause excessive shrinkage of concrete at these locations leading to cracking. Also, the surface concrete over the dowel locations becomes weak due to a high water cement ratio, leading to an abrasion of mortar from the surface.

4.2.7. Surface Popouts

A popout is a conical fragment that breaks out of the surface of the concrete leaving a hole that may vary in size. Usually a fractured aggregate particle will be found at the bottom of the hole, with part of the aggregate still adhering to the point of the popout cone. The cause of a popout is a piece of porous rock having high water absorption and relatively low specific gravity. As the offending aggregate absorbs moisture, its swelling creates internal pressure sufficient to rupture the concrete surface. Pyrite, hard-burned dolomite, coal, shale, soft fine-grained limestone, clay lumps, or chert commonly cause popouts. They may also be caused by water uptake of expensive gel formed during the chemical reaction between the alkali hydroxide in the concrete and reactive siliceous aggregates. Most popouts appear within the first year after placement. Popouts caused by an alkali-silica reaction may occur as early as a few hours to a few weeks, or even a year, after placement of concrete. Popouts caused by moisture-induced swelling may occur shortly after placement due to the absorption of water from the plastic concrete or they may not appear until after a season of high humidity or rainfall. Popouts are considered a cosmetic detraction and generally do not affect the service life of the concrete.

4.2.8. Curb Cracking

Curb cracking mainly occurs wherever the curbs are cast monolithically with a concrete pavement slab and bus pads. It may also be observed, though not so predominantly, on the curbs laid cast-in situ with curb casting machines but not casted monolithically with the slabs. In both cases, cuts are provided into curb stones just opposite the transverse joints of the pavement to allow the expansion and contraction of the curbs. If the joint of these curbs is blocked by soil, stone grits and other material then the expansion of curbs along with concrete slabs becomes difficult, and due to excessive compressive stresses, curbs may crack.

4.3. Solutions and Repair Methodology

As discussed, repairing concrete pavement slabs and bus pads is always difficult and costly as compared to asphalt or other flexible pavements. However, the strength and durability of rigid pavements, in most cases, make them more feasible and cost-effective in the long term. Depending on the type of defects, the method of repair differs; therefore, it’s important to first figure out the cause and type of defects in order to choose the best solution for repairing. A list of repair methods of concrete pavements is as follows:

4.3.1. Full-Depth Repair

Full-depth repair is a concrete pavement restoration technique that can be used to restore the structural integrity and reliability to concrete pavements having certain types of distress. It involves making lane-width, full-depth saw cuts to remove the deteriorated concrete down to the base, repairing the disturbed base, installing load-transfer devices, and refilling the excavated area with new concrete. It is an effective, permanent treatment to repair pavement distresses, particularly those that occur at or near joints and cracks. By removing and replacing isolated areas of deterioration, full-depth repairs may delay or stop further deterioration and restore the pavement close to its original condition. The distresses that can be addressed using full-depth repairs include transverse cracking, corner breaks, longitudinal cracking, deteriorated joints, D-cracking, blowups, and punchouts.

4.3.2. Selection of patch size

It is important that the boundaries be located so that all significant distresses are removed. Deterioration near joints and cracks may be greater at the bottom of the slab than at the top. Therefore, further investigation should be performed. The location of patch boundaries also depends on the level of load transfer which is to be provided. The patches must be of sufficient size to eliminate rocking and longitudinal cracking of the patch. A minimum patch length of 1.75 m and full-lane patch width of 3.5 m is recommended to provide stability and prevent longitudinal cracking. For the same reason, the minimum remainder of the slab must be at least 1.75 m for a 3.5 m wide slab. However, if the distressed areas in both lanes are similar and both lanes are to be repaired, aligning repair boundaries to avoid small offsets and maintain continuity may be desirable.

Patch surface may be textured so that it is similar to the surface of the surrounding pavement. The first few hours after pouring the concrete are the most critical for good curing. Therefore, a liquid-membrane-forming curing compound should be applied immediately after texturing over the surface of newly placed concrete. To prevent moisture loss and protect the surface against the occurrence of plastic shrinkage cracks, a polythene sheet may be placed over the patch surface.

The outer boundaries of a repair should be cut by a diamond blade saw cut machine. Deteriorated concrete from the repair area may be removed either by lifting out or breaking up. It is preferable to lift the deteriorated concrete whenever possible. Lifting the old concrete imparts no damage to the subbase and is usually faster and requires less labor than any method that breaks the concrete before removal. For lifting out, holes are drilled into the old concrete surface, then lift pins are inserted into holes and concrete is removed with the help of chains fastened to a crane. Deteriorated concrete may also be removed by breaking it into small pieces. The drawback of this method is that it often damages the subbase. If the subbase has been damaged during the removal operation of the old concrete then it would be necessary to repair it by adding and compacting new subbase material.

The final step is to saw transverse and longitudinal joint sealant reservoirs at the patch boundaries. Sealed joints will lower the potential for spalling at the patch joints. The joints may be filled with any suitable joint sealant.

4.3.3. Placing & finishing the new concrete

Place and evenly spread pavement quality concrete to the appropriate surcharge. Thoroughly compact the concrete using internal vibrators and then finish the surface with the help of a screed vibrator. Particular care should be taken to ensure full compaction around the dowel bars and edges of the repair. The patch surface should match the surrounding surface profile.

4.3.4. Cross-Stitching

Cross-stitching is a repair technique for longitudinal cracks which are in reasonably good condition. The purpose of cross-stitching is to maintain aggregate interlock and provide added reinforcement and strength. The tie bars used in cross-stitching prevent the crack from vertical and horizontal movement or widening. This technique knits the cracked portions of the slab together and reduces the chances of the crack to grow further.

Cross-stitching uses deformed tie bars drilled across a crack at angles of 30-45 degrees. Deformed steel bars of 10-12 mm diameter are sufficient to hold the crack tightly closed and enhance aggregate interlock. Full depth holes of 18-20 mm diameter are drilled at a pitch distance of 300 mm with the offset of 150 mm from the crack. The holes are drilled alternately from each side of the crack so that one-hole passes through the crack from left to right while the next from right to left. After drilling, the holes are flushed with high pressure air to clean out any residual dust. Then a high strength epoxy gel adhesive is injected into the holes. Immediately after injecting epoxy, deformed steel rods are inserted into each hole. The crack is sealed at the top with a silicon sealant.

4.3.5. Slab Replacement

In cases where a slab has full depth and intersecting multiple cracks, slab replacement become necessary. It involves the demolition and replacement of the affected slab. Prior to breaking out of the affected slab, a full depth saw cut should be made around the perimeter of the repair to minimize the damage to the surrounding slab. This should include the existing transverse joints on both sides. Care should be taken to ensure that the saw cut does not extend into adjacent slabs. If it accidentally happens then the cut into the adjacent slab should be repaired with epoxy mortar. The concrete of the affected slab may then be sawn into smaller pieces before being broken up and removed from the slab. The concrete that remains in the corner of the patch after saw cutting should be broken out carefully to avoid undercutting the remaining slab. Reinstatement of the sub-base, if required, should be done by taking care of full compaction especially in the corners. A plate vibrator should be used to compact the subbase. Fixing of dowels into drilled holes, placing, compacting, finishing, texturing and curing of fresh concrete into the patch will be as described in the full-depth repair section.

4.3.6. Concluding Remarks

Many types of cracks such as uncontrolled transverse full-depth cracks, plastic shrinkage cracks, full-depth cracks near slab culverts, cracks over dowel bars, etc., have been observed on the concrete road projects that have been completed recently. All such cracks can be prevented or minimized by making the site staff aware of the precautions to be taken during concrete paving. Due care during construction can reduce the troubles which otherwise would be very difficult and costly to remove after the concrete has set.

4.4. Existing Pavement Design Methods

4.4.1. American Association of State Highway and Transportation Officials (AASHTO)

The AASHTO Pavement Design Guide was based on the field testing of flexible and rigid pavement structures in Ottawa, Illinois, in the late 1950s and early 1960s [24] [25]. This empirically based pavement design procedure is used by many practicing engineers worldwide. The AASHTO guide is based on the performance of the test sections under truck traffic and environmental conditions. One major output of the AASHO Road Test was the load equivalency factor (LEF) concept. LEFs were used to quantify the damage different axle loads and configurations caused to the pavement relative to an 80 kN single axle load (dual wheels). The equivalent single axle load (ESAL) was developed to be the total number of passes of an 80 kN standard axle. ESALs are calculated by multiplying and summing each individual axle load and configuration by its corresponding LEF for a particular pavement structure. One shortcoming of rigid pavement LEFs is that they are based on the performance of the AASHTO Road Test concrete pavements, most of which failed due to pumping and erosion. This type of failure is not the predominant failure mode in many rigid pavement structures, and many rigid pavements fail because of faulting and fatigue cracking.

4.4.2. Portland Cement Association (PCA)

The latest versions of the Portland Cement Association (PCA) thickness design for concrete highway and street pavements have more mechanistic features than the empirically based AASHTO guide [26] [27]. The PCA uses the load spectra analysis to calculate the bending stress in the concrete due to various axle loads and configurations. Load spectra analysis is more theoretically sound than ESAL analysis because fundamental stresses and strains are calculated and related to the performance of laboratory concrete fatigue beam tests. Load spectra analysis also allows for calculation of pavement stresses due to an axle load and configuration not originally considered in the AASHO Road Test. The PCA guide also has many limitations, such as not taking into account temperature stresses in the slab, no ability to analyze widened lanes or different joint spacings, top of the base k-value concept, and no consideration of load transfer across the shoulder-lane joint. The top of the base k-value concept refers to increasing the apparent strength of the subgrade based on the thickness and type of base material.

In this research a numerical method will be employed and verified with experimental results. The soil and slab stiffnesses will be taken into account and a more realistic method to apply moving and temperature loads will be used to analyze load distribution, soil pressure, and the slab strength.

4.5. Fatigue Design

A number of experimental and numerical studies have been conducted on fatigue resistance of concrete pavements, and several models have been proposed to design rigid pavement for repetitive loads. For instance, Roesler [28] proposed the following equation to determine number of load application until failure for a concrete pavement subjected to fatigue loads:

$$N_f = \left[\frac{1.2968}{(\sigma/MOR)}\right]^{32.57} \qquad \text{Equation 1}$$

Where Nf = number of load application until failure, σ = applied maximum stress level, and MOR = modulus of rupture of the concrete.

Another equation was proposed by Dater [29] which was derived out of 140 fatigue beam results from three published works including Kesler [30], [31], [32]:

$$Log(N_f) = 17.61 - 17.61(\frac{\sigma}{MOR}) \quad \text{Equation 2}$$

The most recent model to predict number of loading cycles for concrete pavement subjected to fatigue loads was proposed in Mechanistic-Empirical Design of New and Rehabilitated Pavement Structures [33]:

$$Log(N_f) = 2.0\left[\frac{MOR}{\sigma}\right]^{1.22} \quad \text{Equation 3}$$

Equation 3 was also used by [34] to verify their results to predict longitudinal fatigue cracking in rigid pavements.

5. Numerical Model and Verification

5.1. Computer Simulation Tool

In this study SAP2000 is used to develop the numerical model and analyze the concrete bus pads. SAP2000 follows in the same tradition, featuring a sophisticated, intuitive and versatile user interface powered by an unmatched analysis engine and design tools for engineers working on transportation, industrial, public works, sports, and other facilities. From its 3D object based graphical modeling environment to the wide variety of analysis and design options completely integrated across one powerful user interface, SAP2000 has proven to be the most integrated, productive and practical purpose structural program on the market today. Advanced analytical techniques allow for large deformation analysis, Eigen and Ritz analyses based on stiffness of nonlinear cases, catenary cable analysis, material nonlinear analysis with fiber hinges, multi-layered nonlinear shell element, buckling analysis, progressive collapse analysis, energy methods for drift control, velocity-dependent dampers, base isolators, support plasticity and nonlinear segmental construction analysis [35].

Shell Element

To simulate the concrete bus pad, the Shell element is used in SAP2000. Shell is a three- or four-node area object used to model membrane and plate-bending behavior. Shell objects are useful for simulating floor, wall, and bridge deck systems; 3D curved surfaces; and components within structural members, such the web and flanges of a W-Section. Shells may be homogeneous or layered throughout their thickness. Temperature-dependent, orthotropic, and nonlinear material properties may be assigned to layered shells.

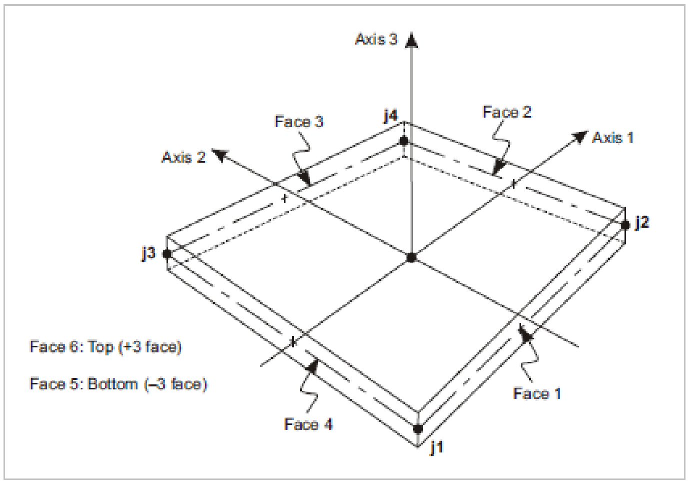


Figure 7. Shell element, local axis and face numbers

There are two types of Shell element in SAP2000, thick and thin; the latter one was employed in this numerical study. The inclusion of transverse shear deformation in plate-bending behavior is the main difference between thin and thick shell formulation. Thin-plate formulation follows a Kirchhoff application, which neglects transverse shear deformation, whereas thick-plate formulation follows Mindlin/Reissner [36], which does account for shear behavior. Thick-plate formulation has no effect upon membrane (in-plane) behavior, only plate-bending (out-of-plane) behavior. Shear deformation tends to be important when shell thickness is greater than approximately 1/5 to 1/10 of the span of plate-bending curvature.

5.2. Modelling of Soil Behavior

For analysis of beams and slabs resting on a soil medium, engineers have been using a classical mathematical model called the Winkler model, in which the behavior of the soil is simplified by means of fictitious springs placed continuously underneath the structure. The corresponding spring constant k is called ‘‘the modulus of subgrade reaction of the soil.’’ [37]. The Winkler’s idealization represents the soil medium as a system of identical but mutually independent, closely spaced, discrete, and linearly elastic springs. According to this idealization, deformation of foundation due to applied load is confined to loaded regions only. The pressure-deflection relationship at any point is given by $p=k.\delta$, where k is modulus of subgrade reaction and δ is deflection.

The subgrade reaction is not only a fundamental soil property [38]. It is a lump constant of which the subgrade reaction from the plate load test should be adjusted because the subgrade reaction is a function of:

1. Soil elastic properties, both the initial response and the long-term response due to soil consolidation from the sustained loading.
2. Loading intensity that will influence the long-term consolidation settlement.
3. Amount of surface area loaded and load shape over which the load is applied. Wider and larger area loadings will involve consolidation of the deeper soil layers.
4. Stiffness of the slab, which will influence the distribution of the soil bearing pressure.

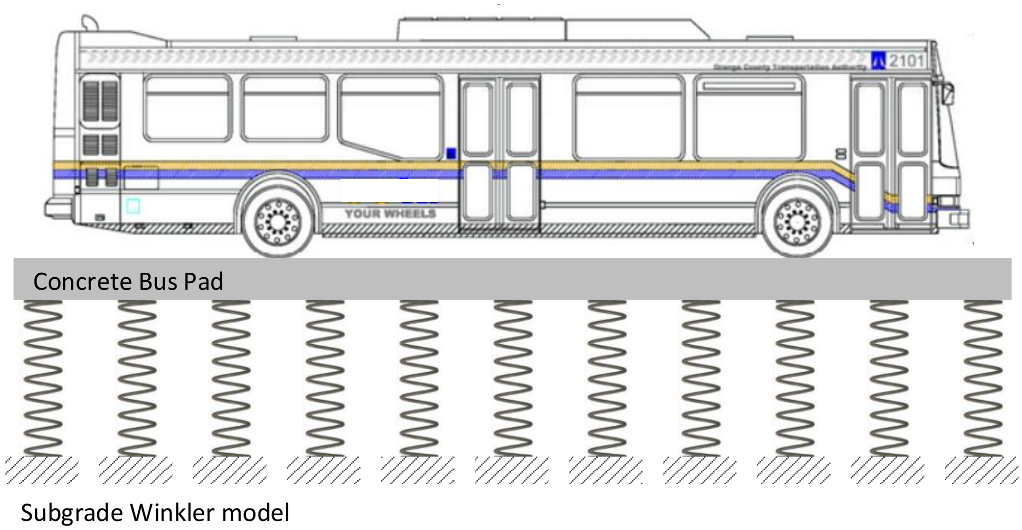


Figure 8. Winkler soil-slab model

As Terzaghi mentioned, proper estimation of contact pressure for a flexible foundation could be very cumbersome, so it is assumed that subgrade modulus ("k" or "k_s") remains constant for the entire footing. In other words, the ratio between pressure and settlement at all locations of a footing will remain constant. Therefore, the displacement diagram of a footing with a load at center will have a dishing effect. A point at the center of the footing will experience the highest displacement. Displacement reduces as it moves away from the center [39] [40].

Bowles stated in his book [41] that it is difficult to make a plate-load test except for very small plates because of the reaction load required. Even with small plates of, say, 450-, 600-, and 750-mm diameter it is difficult to obtain 8 since the plate tends to be less than rigid so that a constant deflection across the plate (and definition of k_s) is difficult to obtain. Stacking the smaller plates concentric with the larger ones tends to increase the rigidity, but in any case, the plot is of load divided by plate contact area (nominal P/A) and the average measured deflection.

It is important to obtain the k_s from the soil tests on site; however, due to the constraints such as cost and time, it is not always easy and possible to use the modulus of subgrade from test. Table 1 shows the range of modulus of subgrade reaction, k_s, for different types of soils, recommended by Bowles [41]. In this project due to the lack of geotechnical tests and soil properties information, the recommended values shown in Table 1 are used in the numerical model. Based on the soil condition of the site, the k_s is considered to be 20,000 kN/m^3 (127.32 kip/ft^3), as medium dense sand.

Table 1. Range of modulus of subgrade reaction k_s [41]

Soil	K_s, kN/m^3
Loose sand	4800-16000
Medium dense sand	9600-80000
Dense sand	64000-128000
Clayey medium dense sand	32000-80000
Silty medium dense sand	24000-48000
Clayey soil:	
$q_a \leq 200$ kPa	12000-24000
$200 < q_a \leq 800$ kPa	24000-48000
$q_a > 800$ kPa	> 48000

Line and Area Springs in SAP2000

There are two types of springs that can be used for modelling soil in SAP2000, 1) linear spring, 2) area spring. The linear springs must be connected to the nodes that are connected to the shell or plate as foundation or pavement, and area springs are used to model soil under a meshed shell/plate element. In this study, the linear springs were used to model the soil based on the Winkler model. When line or area springs are assigned to an object, SAP2000 generates equivalent joint springs at each node created. Joint-spring stiffness is determined from tributary area and the line- or area-spring stiffness which is assigned to the object. As a result, joint springs which support interior joints are stiffer than those at corner joints. Since contact pressure is proportional to joint-spring deformation and the displacement of those joints to which springs are attached, users may obtain contact pressure through the product of spring-stiffness constant and displacement, available for output in both graphic and tabular format.

The Winkler spring method assumes that the slab sits on vertical linear springers representing the deformable (linear elastic) soil. The stiffness coefficient of a Winkler spring k_s is expressed as the product of the area A_s of the portion of the slab influenced by the spring (the tributary area) and the parameter modulus of subgrade reaction k_s (Figure 9), which is defined as:

$$k_s = \frac{q}{w}$$

Where q is the foundation pressure exerted to the soil and w is the resulting settlement [42].

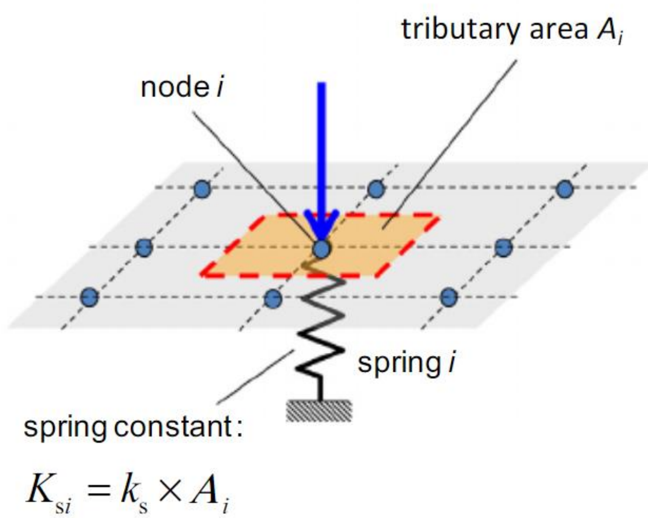


Figure 9. Computational model of the Winkler spring analysis approach

5.3. Model Geometry

Based on the field measurement, the dimensions and proportions of the concrete bus pads in the numerical model are 10 feet wide by 34 feet long (Figure 10). However, the existing design of the bus pad in Baltimore is a little different from the as-built dimensions, according to Figure 11. In order to ensure the accuracy of the results and include the exact tire footprint, mesh sizes are considered to be very fine with a max size of 0.415 ft. The size and proportion of the slab along with the thickness significantly influence the load distribution due to the interaction between soil and pavement. Thus, designing an appropriate size of slabs for the bus pad and considering the accurate soil properties will help to precisely analyze internal forces and moments as well as deflection and soil pressure to predict concrete surface cracking and failure of the bus pad.

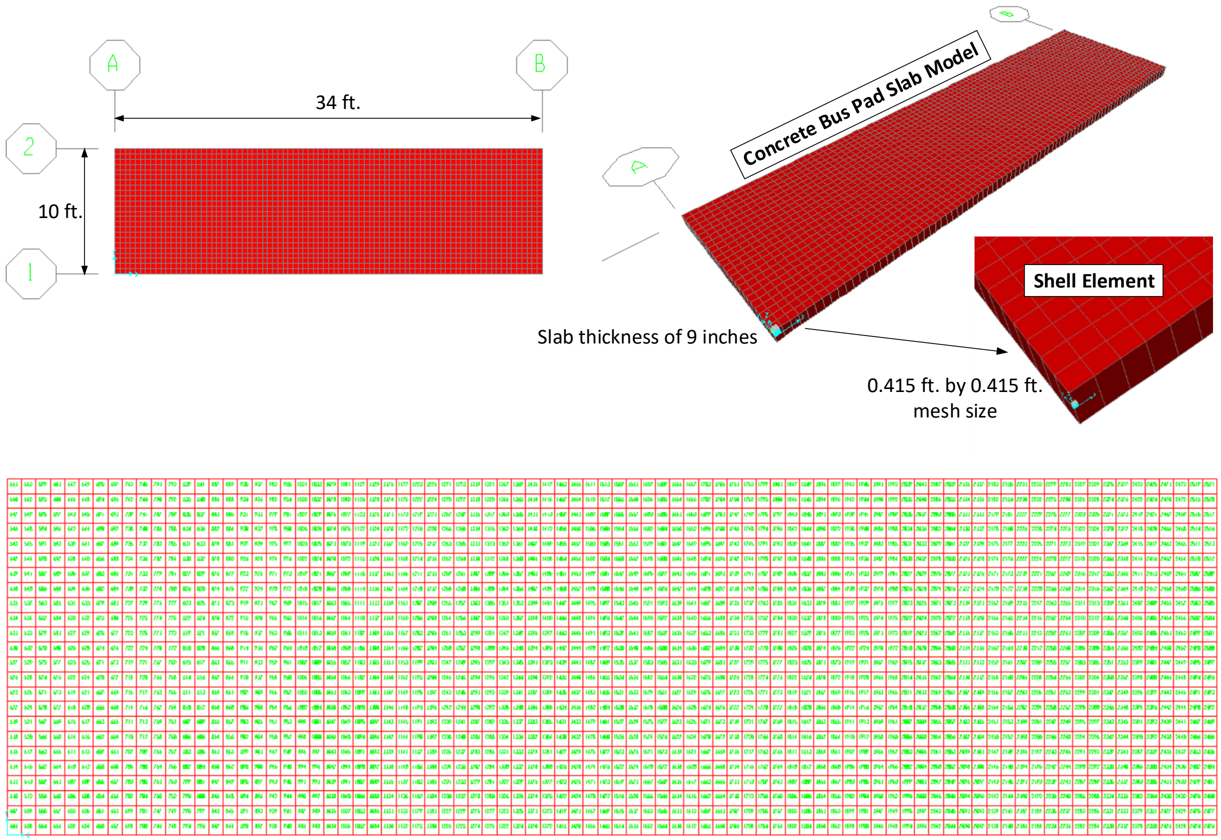
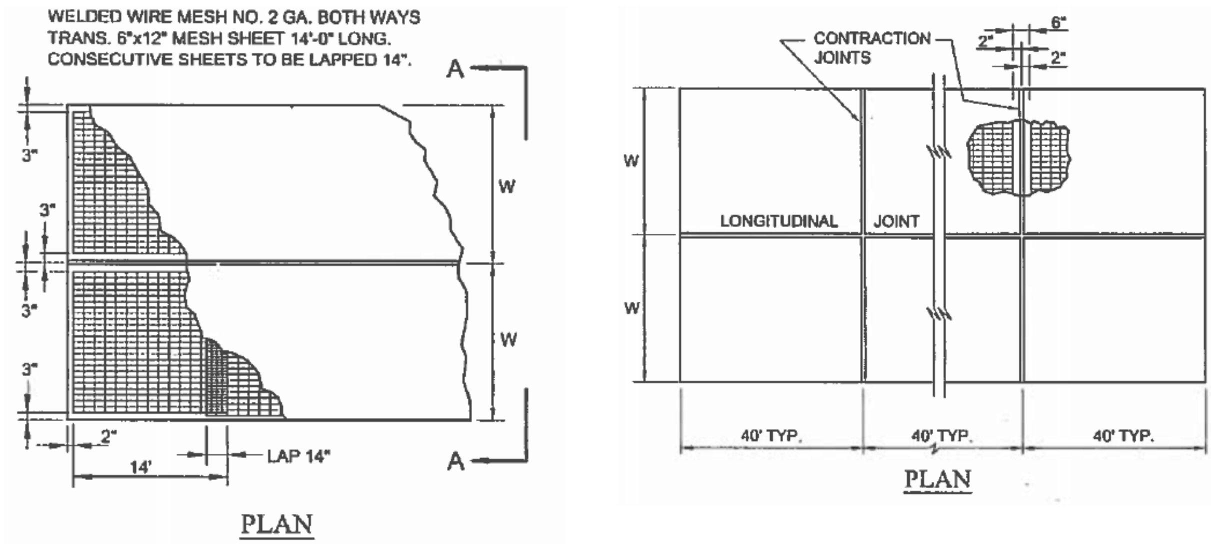
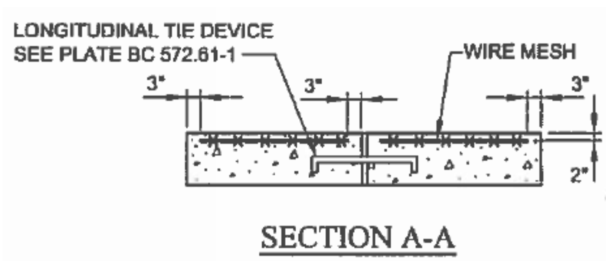


Figure 10. The SAP2000 model dimensions, meshing, and element labels

As seen in Figure 11, the existing bus pad design shows a two-way welded wire mesh with No. 2 GA with a size of 6 inches by 12 inches, for reinforcing the concrete slab which must be placed at top face. Dimensions of the mesh are also indicated in this drawing for different lane widths. Given the limited size of each welded wire mesh, an overlap of 14 inches is also considered for the reinforcement. The concrete cover from the top face must be 2 inches to the center of the wire mesh and a longitudinal tie device is also placed at the joints where each slab ends. Based on this design, a denser mesh is required in longitudinal axis with 6 inches spacing, and 12 inches spacing must be considered in the transverse direction. In order to evaluate this design, a comparison between the existing design and required size and reinforcement based on the finite element analysis and test will be performed and details will be analyzed and discussed in the conclusion and design recommendation sections.





LANE W	MESH		WEIGHT PER MAT LBS.
	WIDTH	LENGTH	
8'	7'-6"	14'	62
10'	9'-6"	14'	76
11'	10'-6"	14'	84
12'	11'-6"	14'	91
13'	12'-6"	14'	96

Figure 11. Placement of bar mats reinforced concrete pavement (City of Baltimore Department of Transportation)

5.4. Loading Scenarios

5.4.1. Load Cases

Different load cases are considered in the numerical model, including dead load, moving load, and temperature load. The self-weight of the concrete slab is applied as uniform distributed load as dead load with slab thickness of 12 inches and normal weight concrete. The design parameters for three bus categories – large bus, mid-size bus, and an articulated bus – were studied. Other small vehicles may also be used for transit services but generally their characteristics are not critical in designing bus pads. This report focuses on the six transit bus types shown in Table 2, herein referred to by their nominal lengths. While this study evaluated various buses, the City of Baltimore primarily has five transit bus types in its fleet including 2-axle and 3-axle buses.

Table 2. Scope of Transit Buses [43]

Transit Bus ID	Transit Bus Type (Nominal Length)	Actual Length (ft)	Conceptual Representation
i	2-axle 35-foot buses	32.5-37.4	
ii	2-axle 40-foot buses	37.5-42.4	
iii	2-axle 45-foot buses	42.5-47.5	
iv	3-axle 45-foot buses	42.5-47.5	
v	3-axle 45-foot double-deck buses	42.5-47.5	
vi	3-axle 60-foot articulated buses	55.0-65.0	

Federal weight regulations for Commercial Motor Vehicles (CMV) are applicable to interstate highways and 160,000 miles of other major roads. State- and locally controlled roads often have separate regulations that differ from federal regulations. Table 3 displays the transit bus single and tandem axle weight limits for each state. This table shows that most states govern transit bus weights under CMV regulations; however, 14 states have separate transit bus weight limits [43].

Table 3. State-specific transit bus axle weight limits [43]

State	Single Wheel	Steering Axle[1]	Single Axle	Tandem Axle[2]	Bus Specific[3]
Alabama	-	-	20,000	-	No
Alaska	-	-	20,000	38,000	No
Arizona	Exempt	Exempt	Exempt	Exempt	Yes
Arkansas	-	20,000	20,000	34,000	No
California	Exempt	Exempt	Exempt	Exempt	Yes
Colorado	Exempt	Exempt	Exempt	Exempt	Yes
Connecticut	Exempt	Exempt	Exempt	Exempt	Yes
Delaware	-	-	22,400	40,000	No
D.C.	-	18,000	22,000	38,000	No
Florida	-	-	22,000	-	No
Georgia	9,040 HP 11,700 LP	- -	18,080 20,340	36,160 40,680	No
Hawaii	-	-	22,500	34,000	No
Idaho	10,000	-	20,000	34,000	No
Illinois	-	-	20,000	34,000	No
Indiana	-	-	20,000	34,000	No
Iowa	-	-	20,000	34,000	No
Kansas	10,000	-	20,000	34,000	No
Kentucky	-	-	20,000	35,700	No
Louisiana	-	-	18,000 HP 20,000 LP	32,000 HP 34,000 LP	No
Maine	-	-	22,400	38,000	No
Maryland	-	-	24,000	Exempt	Yes
Massachusetts	-	-	22,400	36,000	No
Michigan	-	-	18,000 HP 20,000 LP	26,000 HP 34,000 LP	No
Minnesota	10,000	-	20,000	34,000	No
Mississippi	-	-	20,500	34,500	No
Missouri	-	-	20,000	34,000	Yes
Montana	-	-	20,000	34,000	Yes
Nebraska	10,000	-	21,000	35,700	No
Nevada	-	-	20,000 ST 25,000 DT	-	Yes
New Hampshire	-	-	23,520	35,700	No
New Jersey	-	-	22,400	34,000	No
New Mexico	11,000	-	21,600	34,320	No
New York	11,200	-	22,400	36,000	No
North Carolina	-	-	20,000	38,000	No
North Dakota	10,000	-	20,000	34,000	No
Ohio	Exempt	Exempt	Exempt	Exempt	Yes
Oklahoma	-	-	20,000	34,000	No
Oregon	Exempt	Exempt	Exempt	Exempt	Yes
Pennsylvania	-	-	23,520	-	Yes
Rhode Island	-	-	22,400	36,000	Yes
South Carolina[4]	8,000 HP 10,000 LP	-	16,000 HP 20,000 LP	36,000	No
South Dakota	-	-	20,000	34,000	No
Tennessee	Exempt	Exempt	Exempt	Exempt	Yes
Texas	-	-	20,000	34,000	No
Utah	10,500	-	20,000	34,000	No

Vermont	-	-	24,640	39,600	No
Virginia	-	-	20,000	34,000	Yes
Washington	-	-	20,000	34,000	No
West Virginia	-	-	22,000	-	No
Wisconsin	11,000 A 6,600 B	-	20,000 A 13,200 B	34,000 A 20,400 B	No
Wyoming	10,000	-	20,000	36,000	No

After the study on buses' weight and load characteristics of buses in different states, AASHTO loads were compared with actual bus loads. Since AASHTO provides more critical loading conditions, the Equivalent Single Axle Load (ESAL) method was used. Although it is not too difficult to determine a wheel or an axle load for an individual vehicle, it becomes quite complicated to determine the number and types of wheel/axle loads that a particular pavement will be subject to over its design life. ***Furthermore, it is not the wheel load but rather the damage to the pavement caused by the wheel load that is of primary concern.*** The most common historical approach is to convert damage from wheel loads of various magnitudes and repetitions ("mixed traffic") to damage from an equivalent number of "standard" or "equivalent" loads. Figure 12 shows AASHTO design truck, tandem, and lane loads that are considered in the present numerical model. According to AASHTO, the greater of the load combinations of the truck plus lane load, and tandem plus lane load must be applied.

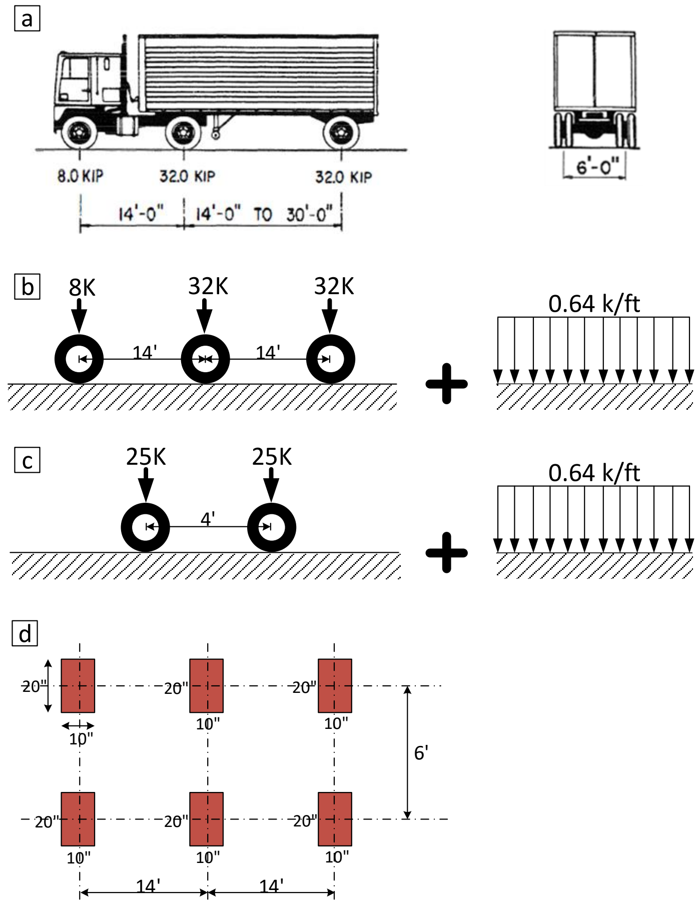


Figure 12. AASHTO design truck, (a) HL-93 vehicular live load, (b) AASHTO truck and lane load combination, (c) AASHTO tandem and lane load combination, (d) AASHTO HL-93 truck tire plan

Regarding the temperature, calculations of the Stresses from Temperature using the Formula Using the Temperature Graph above for T_Δ and the formula for stresses in the x and y (σ_x, σ_y)

$$\sigma_x = \frac{E\alpha_t T_\Delta}{1-\mu^2}\left(C_x + \mu C_y\right),\ \sigma_y = \frac{E\alpha_t T_\Delta}{1-\mu^2}\left(C_y + \mu C_x\right) \qquad \text{Equation 4}$$

C_y= .52 Normalized Dimension in Y direction using Bradbury (1938) Chart

C_x= 1.02 Normalized Dimension in X direction using Bradbury (1938) Chart

μ= Poisson's Ratio

T_Δ= Change in Temperature (Max Temperature - Average Low Temperature)

E= Modulus of Elasticity

α_t= Coefficient of thermal expansion

σ_x= Stress Caused by Temperature in X Direction

σ_y= Stress Caused by Temperature in Y Direction

The graph below was created using the record height temperature and the average low temperature to show the extreme scenarios that caused the maximum stress in the concrete slab.

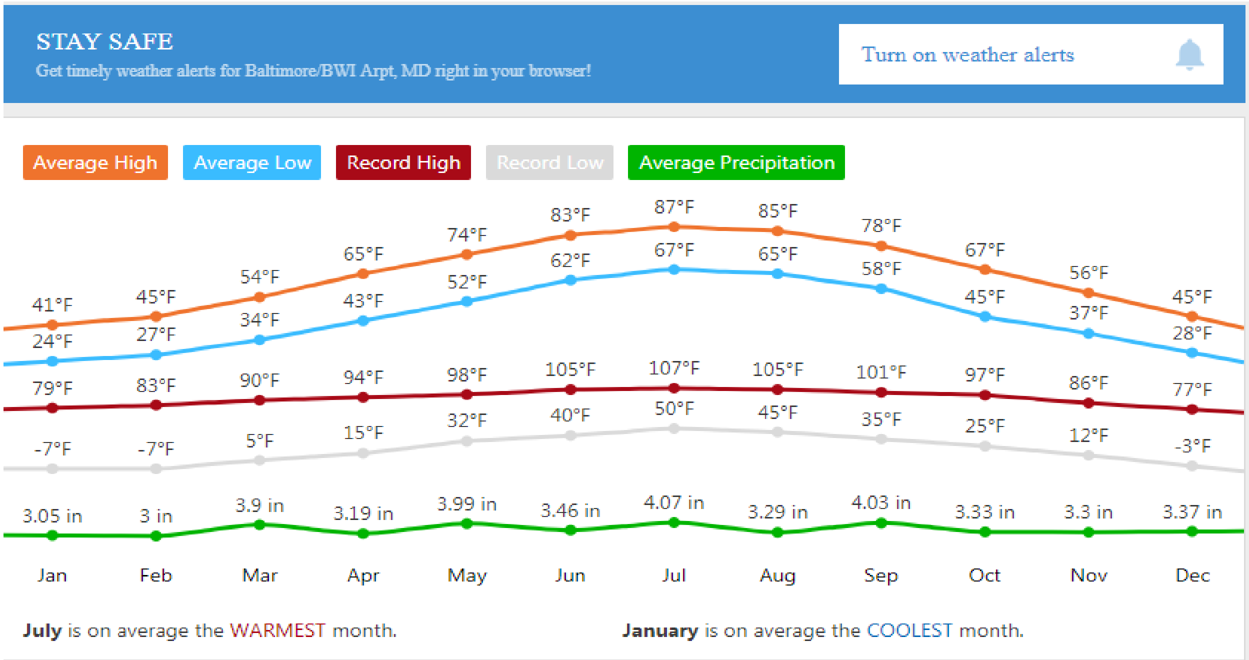


Figure 13. Temperature Chart for Baltimore City for 2017

Based on Equation 4 the thermal stress σ_x, σ_y, in X and Y directions were calculated and listed in Table 1 and Figure 14. The maximum σ_x, σ_y can be seen in July with 2.65 MPa and 4.32 MPa respectively, while the minimum values can be obtained in January with 0.96 MPa, and 1.56 MPa.

Table 4. Thermal Stress in different months for X and Y directions for a rigid pavement

Month	σ_x (MPa)	σ_y (MPa)
January	0.96	1.56
February	1.09	1.79
March	1.44	2.36
April	1.76	2.87
May	2.07	3.38
June	2.48	4.05
July	2.65	4.32
August	2.55	4.17
September	2.29	3.73
October	1.88	3.07
November	1.42	2.32
December	0.99	1.61

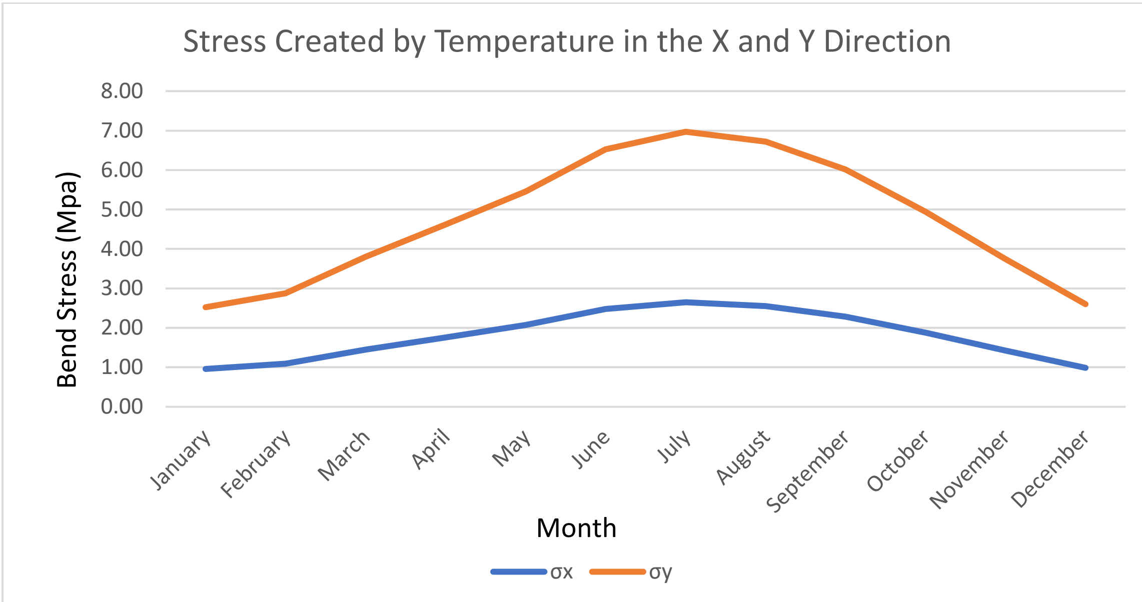


Figure 14. Thermal stress calculated based on Equation 4 for different months in a year

5.4.2. Load Combinations

According to AASHTO, the total factored force effect shall be taken as:

$$Q = \sum \eta_i \gamma_i Q_i$$

Where η_i is load modifier, Q_i is force effect, and γ_i is load factor.

The Strength I load factors, based on Table 3.4.1-1 and Table 3.4.1.-2 of AASHTO, are used, with the maximum of 1.25 load factor for dead load and 1.75 for moving live load. The temperature loads are applied as uniform temperature and the minimum and maximum load factor of 0.5 and 1.2 respectively. More than 130 load combinations are examined in order to extract the most critical load scenario to analyze and design the concrete slab.

Table 5. AASHTO load combinations and load factors, Table 3.4.1-1

Load Combination Limit State	*DC DD DW EH EV ES EL PS CR SH*	*LL IM CE BR PL LS*	*WA*	*WS*	*WL*	*FR*	*TU*	*TG*	*SE*	Use One of These at a Time *EQ*	*BL*	*IC*	*CT*	*CV*
Strength I (unless noted)	γ_p	1.75	1.00	—	—	1.00	0.50/1.20	γ_{TG}	γ_{SE}	—	—	—	—	—
Strength II	γ_p	1.35	1.00	—	—	1.00	0.50/1.20	γ_{TG}	γ_{SE}	—	—	—	—	—
Strength III	γ_p	—	1.00	1.40	—	1.00	0.50/1.20	γ_{TG}	γ_{SE}	—	—	—	—	—
Strength IV	γ_p	—	1.00	—	—	1.00	0.50/1.20	—	—	—	—	—	—	—
Strength V	γ_p	1.35	1.00	0.40	1.0	1.00	0.50/1.20	γ_{TG}	γ_{SE}	—	—	—	—	—
Extreme Event I	γ_p	γEQ	1.00	—	—	1.00	—	—	—	1.00	—	—	—	—
Extreme Event II	γ_p	0.50	1.00	—	—	1.00	—	—	—	—	1.00	1.00	1.00	1.00
Service I	1.00	1.00	1.00	0.30	1.0	1.00	1.00/1.20	γ_{TG}	γ_{SE}	—	—	—	—	—
Service II	1.00	1.30	1.00	—	—	1.00	1.00/1.20	—	—	—	—	—	—	—
Service III	1.00	0.80	1.00	—	—	1.00	1.00/1.20	γ_{TG}	γ_{SE}	—	—	—	—	—
Service IV	1.00	—	1.00	0.70	—	1.00	1.00/1.20	—	1.0	—	—	—	—	—
Fatigue I— *LL, IM & CE* only	—	1.50	—	—	—	—	—	—	—	—	—	—	—	—
Fatigue II— *LL, IM & CE* only	—	0.75	—	—	—	—	—	—	—	—	—	—	—	—

To simulate the moving load of a truck on the bus pad slab, 44 different scenarios were considered based on the location of the truck tires on the slab. A total of 131 load combinations was defined and employed in the simulation, and they are provided in Table 6, where DL is dead load, LL is combination of truck and lane load, and T is temperature load.

Table 6. Defining load combinations

$Q_{1-44} = 1.25DL + 1.75\sum_{1}^{44} LL$	Load combinations 1 through 44	Dead Load, Truck Load, Lane Load
$Q_{45-88} = 1.25DL + 1.75\sum_{1}^{44} LL + 1.2T$	Load combinations 45 through 88	Dead Load, Truck Load, Lane Load, Temperature Load
$Q_{89-131} = 1.25DL + 1.75\sum_{1}^{44} LL + 0.5T$	Load combinations 89 through 131	Dead Load, Truck Load, Lane Load, Temperature Load

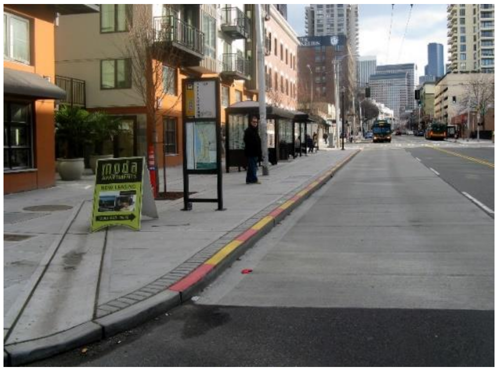
5.5. Finite Element Results

5.5.1 Slab Analysis

In designing a floor slab and mat foundation in buildings, there are two different types of slabs, 1) one-way slab, 2) two-way slab. A one-way slab is mainly supported from two sides and the bending only occurs in one direction, but a two-way slab is supported by four sides (beams or walls) and the slab bends in two directions. Modelling a concrete slab on flexible springs reveals that the behavior of the slab is similar to a two-way slab, as there is bending in two directions.

In the present work, the analyses of concrete bus pads for 131 load combinations were performed and maximum results are provided in Figure 15. In SAP2000, local and global coordination systems can be defined. The local coordination system depends on orientation of shell elements and the global coordination system is specified for the entire model. Based on the local coordination systems, forces and moment about different axes can be extracted from the results. In the present model, M11, which is the moment in local axis “1,” represents the moment in longitudinal axis, and M22 represents the moment in transverse axis. The finite element model consists of 2,125 nodes and 2,016 shell elements. Due to the large size output data, the moment results of 131 load combinations for four shell elements were extracted and provided in Appendix A. The maximum M11 and M22 for both negative and positive moments are extracted from the 131 load combinations which can be seen in Figure 15. ***The maximum positive moment in longitudinal axis is 8.25 kips-ft which occurs in load combination 20, and the maximum***

negative moment in longitudinal axis is -5.0 kips-ft which occurs in load combination 17. For the transverse direction, the maximum positive and negative moments are 5.0 and -3 kips-ft. respectively, occurring in load combination 6.



Baltimore City most common transit bus size (ID: ii, Table 2)
40-ft length

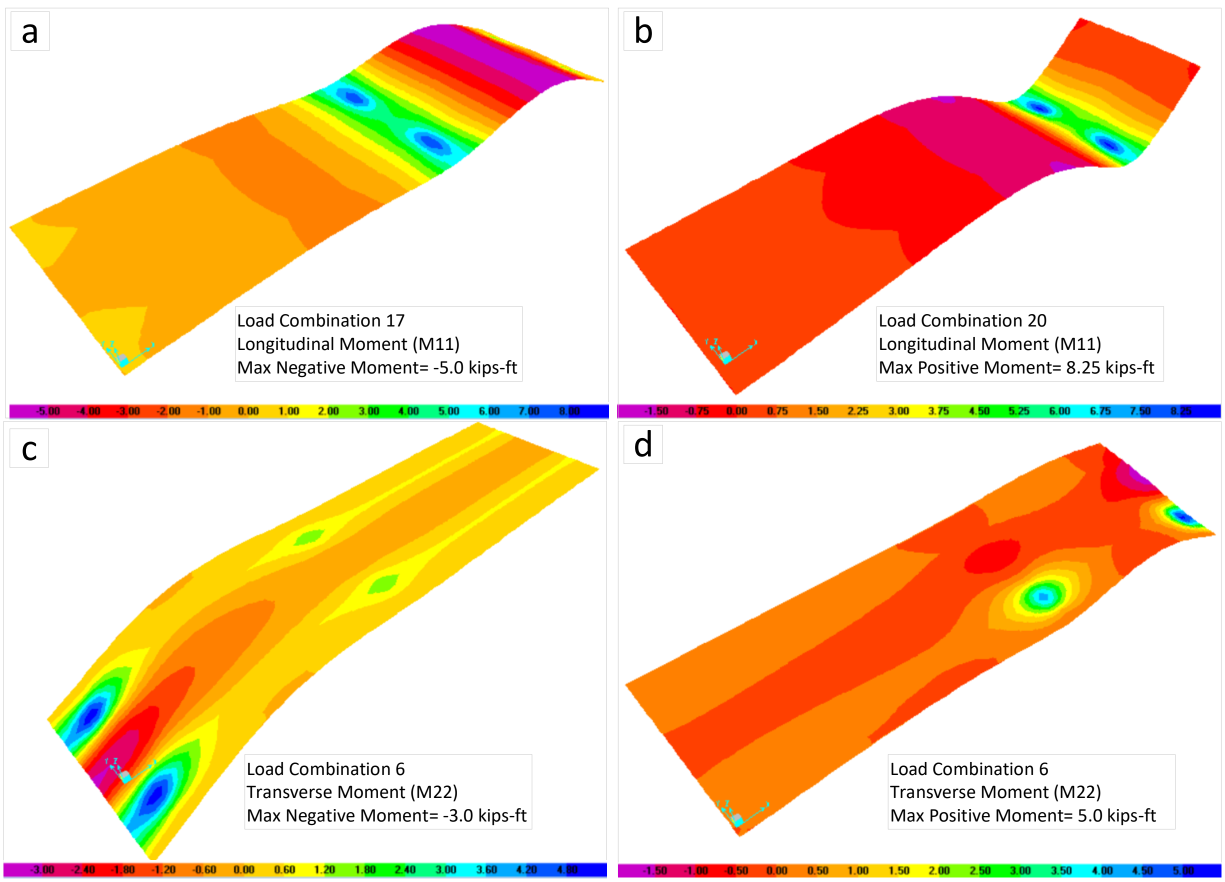
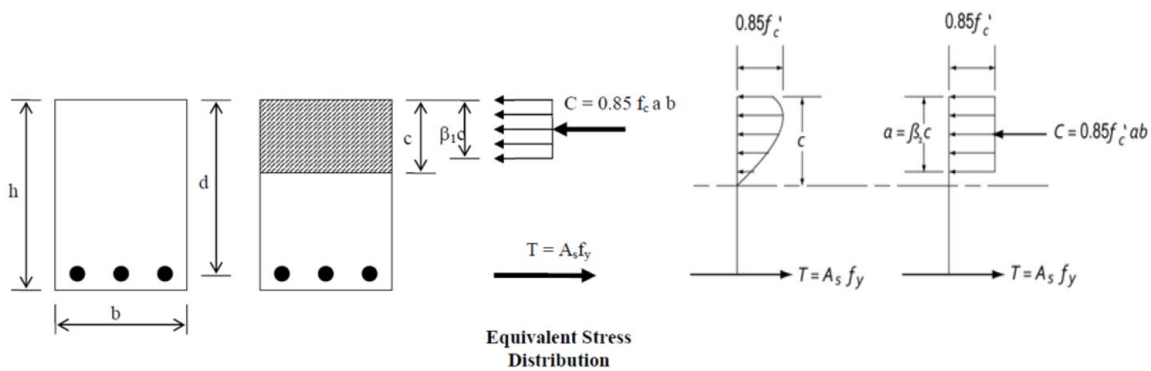


Figure 15. Maximum moment results among the 131 load combinations for AASHTO equivalent truck load with k_s=20,000 kN/m^3, (a) maximum negative longitudinal moment, (b) maximum positive longitudinal moment, (c) maximum negative transverse moment, (d) maximum positive longitudinal moment.

*Note: There are 18 different types of buses currently in service in Maryland Transit Administration bus service and the most common type is ID (ii) indicated in Table 2. However due to the greater load effect on bus pad design, the AASHTO equivalent truck load is considered in the present study.

5.5.2 Slab Bending Strength and Required Reinforcement

In order to redesign and evaluate the existing design of the slab, the strip method is used along with the strength limit state for flexural reinforced concrete members according to ACI 318 [44] Building Code Requirements for Structural Concrete. The comparison is conducted for a flexural member with a unit width and height of slab's thickness. A list of different design cases is provided in Figure 16 for the same slab thickness which is the thickness of the existing bus pad, and different reinforcements. This reinforcement can be considered for both negative and/or positive moments, depending on the requirement extracted from the FE analysis. Nine different reinforcements are analyzed and nominal moments are calculated. Moment at crack (M_{cr}) is also determined for the section where the concrete in tension cracks based on the rupture point (f_r) in concrete. As seen in this figure, up to the 2#3 reinforcement case, the calculated nominal moments are less than M_{cr}; that means the reinforcement cannot effectively increase the strength, but it makes a little enhancement in the deflection response of the slab, reducing the deflection by considering the steel rebar and transforming section.



Rebar	No rebar	1#2	2#2	3#2	1#3	2#3	3#3	1#4	2#4	3#4
ρ	0	0.000595	0.00119	0.001785	0.001351	0.002702	0.004053	0.002424	0.004848	0.007272
M_n (k-ft/ft)	M_{cr}	1.40	2.78	4.14	3.09	6.10	9.03	5.39	10.52	15.39

Section width= 12 inch

Height= 9 inch

Cover= 2 inch

$f_c' = 3\ ksi$

$f_y = 50\ ksi$

$f_r = 0.41\ ksi$

M_{cr}= 5.54 k-ft/ft

Figure 16. Calculation of nominal moment for slab sections with different reinforcement

5.5.3 Effect of soil stiffness and subgrade modulus

In addition to the concrete slab stiffness, the soil characteristics and particularly the soil stiffness significantly affect the load distribution on the slab. Stiffer soils and stiffer slabs provide strong support, and that distributes the load more uniformly, while more flexible soil distributes the load more locally and less uniformly. A parametric study was conducted using the numerical models to examine six (6) different subgrade modulus and figure out the effect of subgrade modulus on the load distribution and eventually the maximum positive and negative moment of the slab. Figure 17 shows the correlation between the subgrade modulus and moment for both positive and negative in longitudinal axis. It can be seen that the negative and positive moments significantly decrease when the subgrade modulus increases because the stiffer soils can distribute the load more uniformly, and consequently the maximum moment decreases.

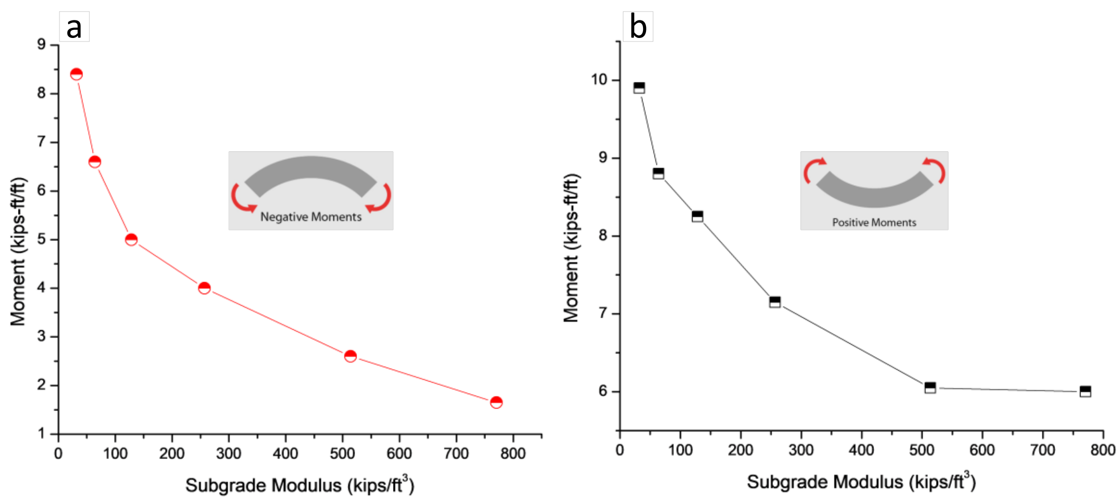


Figure 17. Effect of subgrade modulus on the maximum slab moment, (a) subgrade modulus versus negative longitudinal moment, (b) subgrade modulus versus positive longitudinal moment.

6. Field Study and Lab Investigation

A concrete bus pad needs to be designed as a rigid pavement. According to the AASHTO Guide for Design of Pavement Structures [45], rigid pavements generally consist of a prepared roadbed underlying a layer of subbase and pavement slab. The subbase may be stabilized or unstabilized. In cases of low volume road design where truck traffic is low, a subbase layer may not be necessary between the prepared roadbed and the pavement slab. The basic materials in the pavement slab are Portland cement concrete, reinforcing steel, load transfer devices, and joint sealing materials. The reinforcing steel used in the slab should have surface deformations adequate to bond and develop the working stresses in the steel. For smooth wire mesh, this bond is developed through the welded cross wires, and for deformed wire fabric, the bond is developed by deformations on the wire and the welded intersections.

6.1. Identification of Crack Types

After visiting a number of concrete bus pads in Baltimore, we identified two major causes for surface cracks: 1) plastic settlement of the subgrade, 2) cracks due to negative moment of the slab section. Figure 18a shows a surface crack on a concrete bus pad that also can be observed on asphalt pavement. The continuous transverse crack in concrete and asphalt is due to the settlement caused by either a lack of proper compaction of soil or placing specific infrastructure (e.g., ducts or manholes) underneath the subgrade. Figure 18b illustrates construction of joints between two bus pad slabs. Unacceptable soil compaction and surface leveling were observed, which can cause settlement (concrete surface crack) and nonuniform slab section, respectively.

Figure 18. Subgrade differential settlement, (a) continuous surface crack on asphalt pavement and concrete bus pad, (b) poor leveling of subgrade surface before concrete pouring at joints

The negative moment resulting from the force (tire pressure of buses or trucks) is another major factor that causes concrete surface cracks. Figure 19 illustrates where buses usually stop on the bus pad and the transverse surface cracks due to the tire pressure of buses that creates negative moment and tension in the concrete top face. Due to the two-way slab action of the bus pad, both positive and negative moments must be controlled; however, in most cases the negative moments create the observable cracks on the top surface of the concrete bus pad, and positive moments mainly create tension forces at the bottom face, which can cause cracks at the interface between the concrete slab and subgrade.

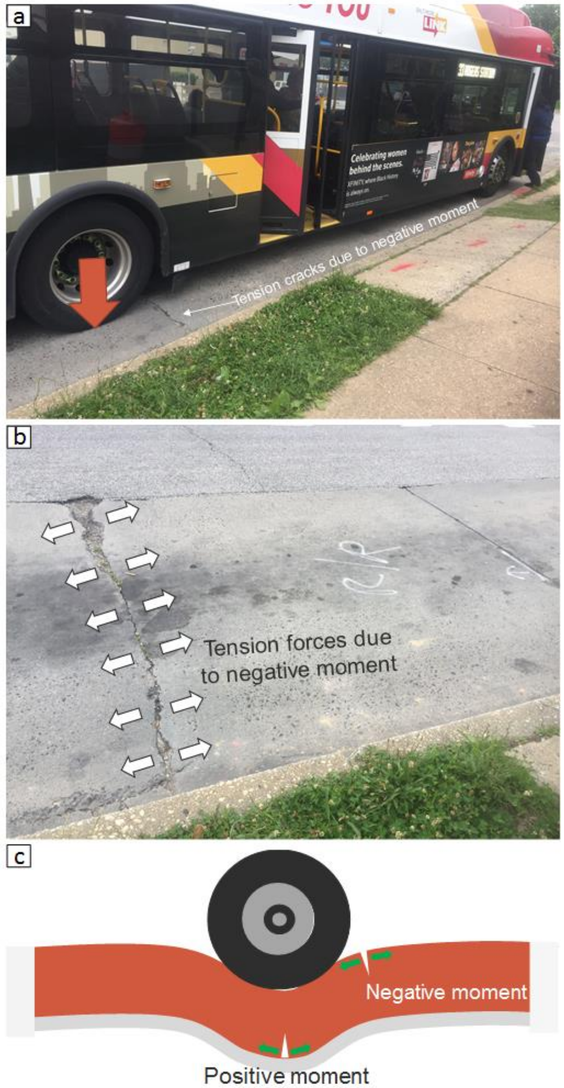


Figure 19. Concrete surface crack due to the slab negative moment, (a) tension cracks at the expected location with maximum negative moment, (b) longitudinal tension forces due to the negative moment and major cracks on concrete, (c) positive and negative moment due to the tire pressure on the concrete slab

According to the bus pad design and drawing previously provided, a welded wire mesh No. 2 GA must be provided at top in the concrete cross section with 2 inches cover from the top face. This was designed to control the negative moment that was previously discussed. The sufficiency of this welded mesh will be discussed in the next section; this section focuses on field observation and construction issues. The construction process for the Baltimore concrete bus pads consists of:

1) cut and remove the asphalt pavement,

2) soil compaction,

3) placing the joints and side forms if needed,

4) pouring concrete and placing welded wire mesh during pouring,

5) finishing.

As can be seen in Figure 20, since the welded wire mesh is placed on the wet concrete surface, it can be easily moved down due to the workers weight or even the weight of the concrete that is being poured on the top. This causes inaccurate placement of wire mesh in the bus pad cross section and can reduce the flexural strength of the slab.

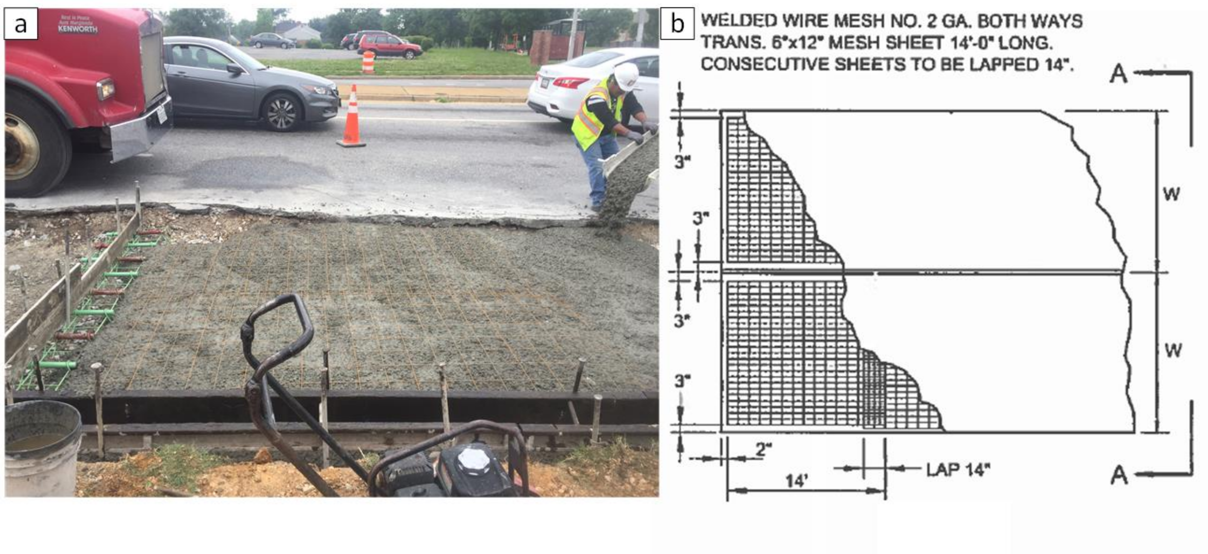


Figure 20. Bus pad concrete pouring and wire mesh placement, (a) no use of spacer and inaccurate placement of wire mesh during construction, (b) detailing of welded wire mesh and joints

6.2. Preparation of Test Specimens

In order to assess the strength of the constructed bus pad in Baltimore City, two strips in longitudinal and transverse directions were cut from an existing concrete bus pad to be tested at Morgan State University Structures Laboratory. The concrete strips are about 80 inches in length, 14-14.5 inches in width, and 9 inches thick as constructed. The aim is to evaluate the flexural strength of concrete slabs in longitudinal and transverse directions regardless of their boundary conditions. This evaluation will then be compared with the required flexural strength based on the finite element model results. It is assumed that these two strips represent the flexural strength of the bus pad slab in both directions; however, in order to increase the accuracy more test specimens are needed.

Figure 21. Preparation of test specimens

6.3. Test setup

The test specimens that were cut from the existing bus pad slab were transported to the Structures Laboratory at Morgan State University. In order to evaluate the flexural strength of the concrete section, a four-point bending test was performed as this can assess the section under pure moment. Two concentrated loads were applied at one-third of the span to create this pure moment in mid-span. Two overhangs were considered with 10 inches length from each side. The

Hi-Tech MAGNUS test frame was used for this experiment that consists of two horizontal and two vertical members made of steel to provide strong support for the test. Due to the limited stroke length of hydraulic cylinders to apply concentrated loads and in order to elevate the concrete specimen, additional beams were placed under the specimen during the test. Calibration was conducted for load and deflection before the test started to ensure the accuracy of test data. Five (5) linear variable displacement transducers (LVDTs) were used to measure the deflection at mid-span and 5 inches from the end supports. Two separate data acquisition systems were used to collect load and deflection measurements. Using the same load and time steps, the load and deflection were interactively assessed.

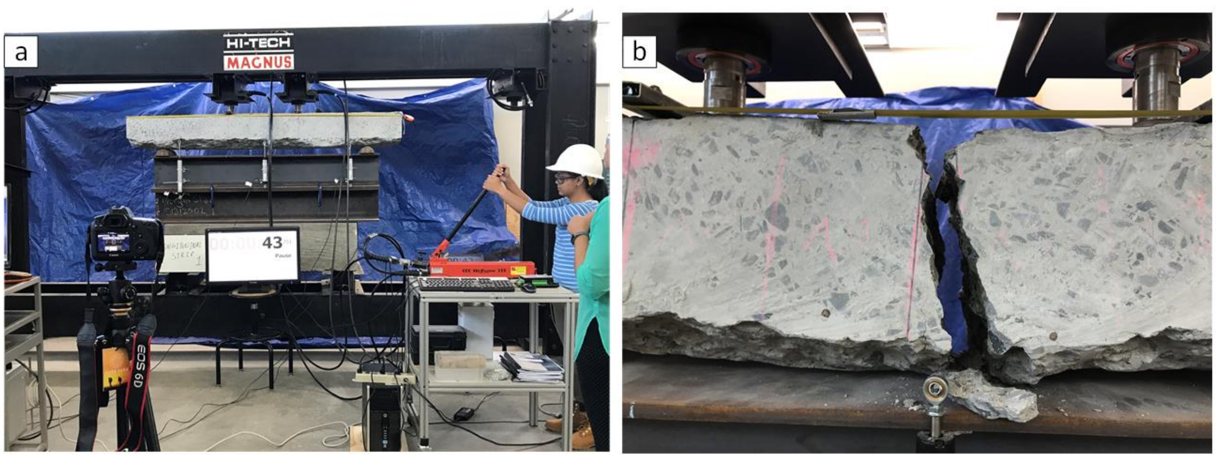


Figure 22. Test setup at Structures Laboratory, Morgan State University, (a) test specimen under four-point bending in Magnus test frame, (b) sudden failure of transverse strip at break point

6.4. Test Results of Longitudinal and Transverse Strips

After collecting the data from the data acquisition system, load and deflection were calibrated using calibration factors obtained in the previous step. The calibrated data were plotted as load versus deflection for both transverse and longitudinal specimens. These results were also compared with a theoretical calculation of elastic load-deflection for a reinforced concrete section with the same dimension and material properties. As seen in Figure 23 for Specimen #1 (transverse strip), the beam broke at 0.0055 inches deflection, which is about 45% of maximum deflection expected based on the existing design. However, it should be noted that based on the observation, no reinforcement was visible in this section after the test, and as can be seen in the plot, the beam was completely split due to the lack of reinforcement that caused sudden failure.

The longitudinal strip, Specimen #2, shows higher load (3,780 lbs.) and larger deflection (0.01185 inches), which is comparable with the theoretical fracture point.

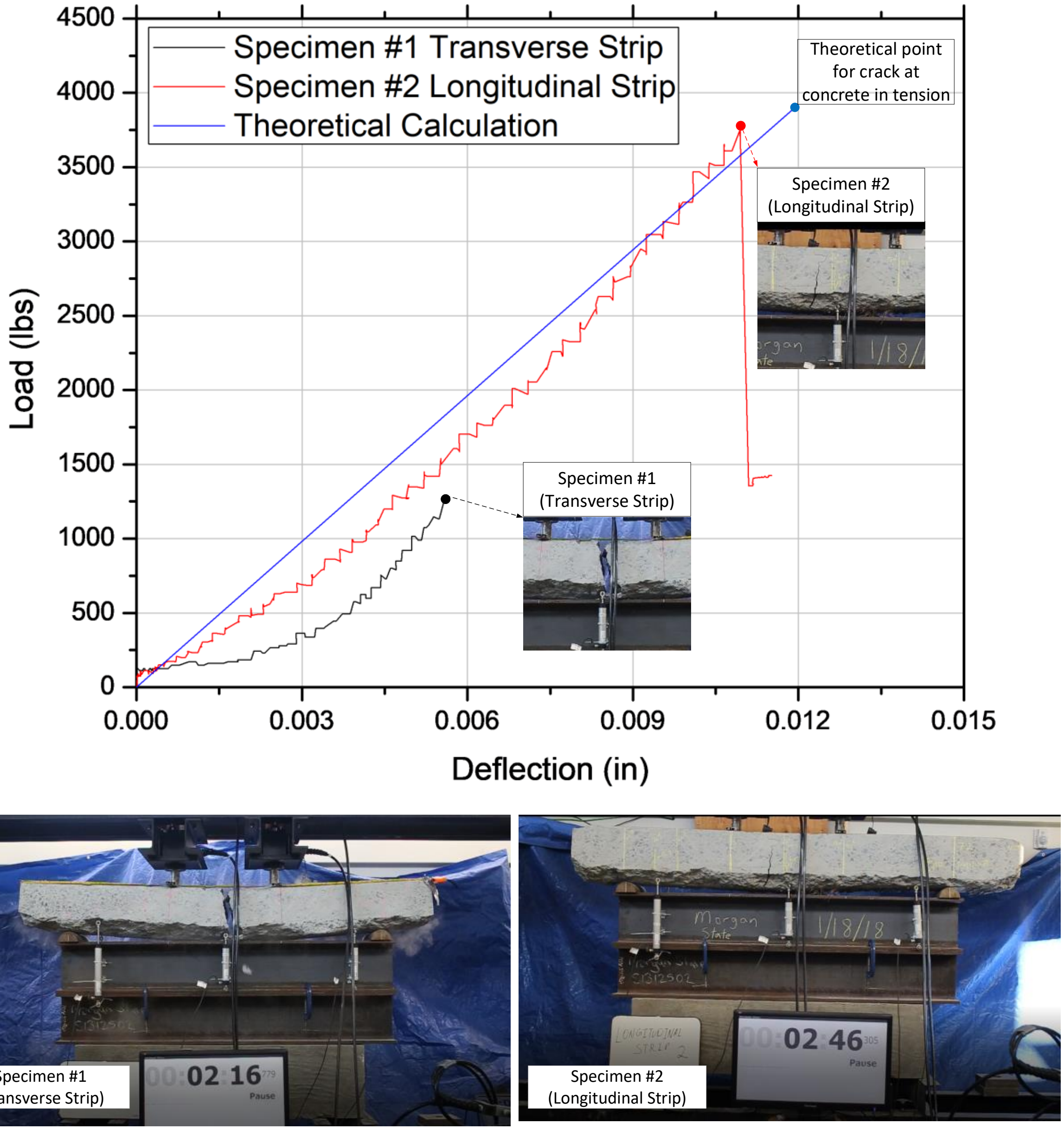
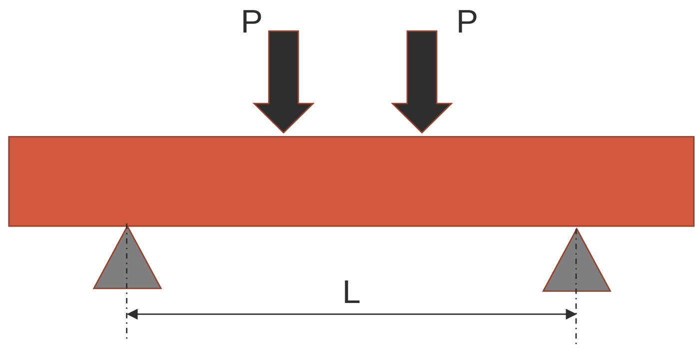


Figure 23. Tests results of transverse and longitudinal specimens, (a) load-time response and comparison between theoretical calculation and test, (b) specimen #1/ transverse strip at break point, (c) specimen #2/ longitudinal strip at break point

The moment capacities of the test specimens were then calculated based on the maximum load at break point. The results are provided in Figure 24 for the four-point bending beam. The lengths are obtained for the actual measurement and P (load) values are based on the maximum applied concentrated load in tests for each side. Since the cross section of the specimens is 9 inches by

14 inches, the moment should be calculated for unit width as kips-ft/ft, in order to make it comparable with the results of finite element model.



	Experimental Results		Theoretical Values
	Specimen #1 (Transverse Strip)	Specimen #2 (Longitudinal Strip)	
L (in)	59.25	62	62
P (kips)	1.24	3.78	3.90
Moment (kips-ft)	2.04	6.51	6.72
Moment (kips-ft/ft)	1.75	5.58	5.76

Figure 24. Test results of transverse and longitudinal strips

As can be seen in Figure 24, Specimen #1 shows lower flexural strength and capacity as compared to Specimen #2. This is due to a smaller longitudinal reinforcement ratio in the first specimen that was observed to be less than the designed steel reinforcement indicated in the drawings. It should be noted that Specimen #1 had sudden failure due to providing reinforcement less than the minimum required steel according to ACI-318. Furthermore, based on the drawing that was provided earlier in the report, the reinforcement ratio of longitudinal direction should be twice the transverse direction, due to the larger moment force. However, the observation from the test revealed that the larger rebar spacing (smaller reinforcement ratio) was incorrectly placed in the longitudinal direction instead of the transverse direction. Consequently, the cracking observed in these slabs is a direct function of how they were constructed; moreover, the slabs were constructed with insufficient reinforcement contrary to the plans to resist the anticipated wheel loads.

7. Conclusions and Design Recommendations

Based on the numerical and experimental studies as well as field observation and design/construction details, the findings are listed as follows regarding the causes of the bus pads' failure analyzed in this study for some roadways in Baltimore City:

Subgrade

- Subgrade settlement can cause much larger moment in the longitudinal and transverse axes of bus pad than design moment. This caused concrete surface cracking and slab failure in many of the bus pads observed in this study.
- Subgrade modulus significantly affects the moving load distribution and soil pressure which consequently changes both longitudinal and transverse moments by up to about 8 times. This means, poor compaction of the subgrade will sufficiently increase moment, something that is underestimated in the design, resulting in concrete surface cracks and failure of the bus pad.

Design and Reinforcement Placement

- Considering more realistic models for moving load and boundary conditions, the moment envelope of the numerical model was extracted and shows that the bus pad experiences 49% larger moment in longitudinal direction than the design moment.
- Placement of the longitudinal wire mesh was considered to be close to the top face of the concrete slab, but based on the numerical results, the maximum longitudinal moment is positive, which requires reinforcement to be close to the slab's bottom.
- As per the site observations, the concrete clear cover was not the same at different places of the slab, which was caused by concrete crews walking on the wire mesh during pouring. This results in varying the slab's flexural capacities, which can cause the concrete surface cracks at the top and bottom face of the bus pad.
- Concrete slab failure due to negative moment can be easily monitored and traced as cracks appear on the slab top face, but the failure due to positive moment cannot be identified and monitored as easily because positive moment cracks initiate from the bottom face of the slab and are not observable. Therefore, more attention needs to be paid in designing bus pad slab for positive moment.

Construction Tolerances and Best Practice Suggestions

- Construction and placement of transverse joints were not properly performed. This can initiate cracks and propagate them to the next slab's section.
- Poor leveling of the slab bed before pouring concrete was observed in the field during the construction, and that results in varying concrete slab depths (in some places depth was less than the design required as indicated in drawings). This can exponentially reduce flexural capacity of slab in both uncracked and cracked sections.

To address the aforementioned issues in the current design of concrete bus pads in Baltimore, and to make a more durable concrete slab toward designing sustainable transportation infrastructure, the following **recommendations** are proposed:

- **Subgrade compaction before pouring slab concrete**. Since most of the bus pads in Baltimore have been constructed in roads with flexible pavement, which are made of asphalt, and the construction of bus pads are mainly performed in existing roads, the asphalt needs to be cut and replaced before the concrete pad's construction is started. Therefore, the subgrade compaction usually is more difficult than soil compaction of a new road, and, as discussed earlier, it can significantly reduce the flexural capacity of the concrete bus pad. Thus, it is highly recommended to ensure the subgrade's compaction before pouring slab concrete. The compaction of edges and corners can be done using small compactors and a compaction test is necessary. In case that compaction of soil (subgrade) is not possible to achieve at the required compaction level, an alternative solution is to stabilize the soil using lime or cement which can be used in lower soil layers as well.
- **Leveling.** The surface of the subgrade and underneath of the concrete bus pad must be completely leveled. It is recommended to take an additional construction step to prepare a surface made of lean concrete, with a thickness of 2-3 inches, on the top of subgrade to ensure the slab's underneath level and slab concrete depth.
- **Provide rebar spacers.** It is required to place sufficient numbers of spacers under rebar to provide the required concrete clear cover for negative and positive moment reinforcement.
- **Design—increase reinforcement for positive moment.** The reinforcement area of positive moment in longitudinal direction must be increased by 49% in order to provide enough bending capacity for a slab.

- **Design—account for temperature and shrinkage reinforcement.** Temperature and shrinkage reinforcement required by ACI-318 must be provided for the bus pad to avoid surface cracks due to shrinkage and temperature changes. This should be at least 3#2 for one foot spacing, which can increase the required bending capacity for both transverse and longitudinal directions.
- **Add fibers to increase concrete strength.** As an alternative solution, steel or glass fibers can be also added to concrete mix to increase bending capacity and control crack development.
- **Inspection.** Inspection during construction and checking tolerances are necessary to ensure quality of work and they can guarantee durability and reduce repair. Transverse joints must be appropriately placed and constructed and filled with a flexible material to avoid cracks development.

8. Future Work

Despite the comprehensiveness of the present work, this work can be expanded in the future to study the following:

1- Study on construction joints and their interaction with slabs to appropriately design the joint depth, thickness and spacing. This requires an experimental investigation as only a few studies have been conducted on this topic.

2- Since most of the cases in this study were newly constructed bus pads, the effect of fatigue loads was not deeply studied. This can be done in the future to evaluate fatigue performance of bus pads experimentally, as they are subjected to repetitive loads with high frequency.

3- Full-scale testing of concrete bus pads and their soil can be conducted to provide a better understanding of the two-way slab’s performance subjected to different loading scenarios as well as assess soil-slab interaction.

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APPENDIX A

Moment results of four selected Shell Elements

TABLE: Element Forces - Area Shells								
Area	**Joint**	**OutputCase**	**M11**	**M22**	**M12**	**MMax**	**MMin**	**MAngle**
Text	Text	Text	Kip-ft/ft	Kip-ft/ft	Kip-ft/ft	Kip-ft/ft	Kip-ft/ft	Degrees
506	1	COMB1	-0.0017	-0.0023	0.0062	0.0042	-0.0081	43.646
506	560	COMB1	0.0666	0.00025	-0.0008857	0.0667	0.0002382	-0.764
506	561	COMB1	0.0811	0.1207	-0.0092	0.1228	0.0791	-77.557
506	562	COMB1	-0.00007259	0.132	-0.0021	0.1321	-0.0001069	-89.077
506	1	COMB2	0.000111	0.0005199	0.0178	0.0181	-0.0174	45.33
506	560	COMB2	0.018	-0.0005984	0.0172	0.0283	-0.0109	30.801
506	561	COMB2	0.0271	0.0352	0.0181	0.0496	0.0126	51.322
506	562	COMB2	-0.0004959	0.021	0.0186	0.0317	-0.0113	59.97
506	1	COMB3	0.0005528	0.0009832	0.0164	0.0172	-0.0157	45.375
506	560	COMB3	-0.0108	-0.0005922	0.0176	0.0127	-0.0241	53.086
506	561	COMB3	0.0004349	0.017	0.0203	0.0306	-0.0132	56.08
506	562	COMB3	-0.0005307	0.005	0.0191	0.0216	-0.0171	49.135
506	1	COMB4	0.00001062	0.0007431	0.0108	0.0112	-0.0104	45.971
506	560	COMB4	-0.0089	-0.0003622	0.0103	0.0065	-0.0158	56.314
506	561	COMB4	-0.0031	0.025	0.0124	0.0297	-0.0079	69.27
506	562	COMB4	-0.000284	0.0161	0.013	0.0233	-0.0074	61.121
506	1	COMB5	-0.0002775	0.0005605	0.0085	0.0086	-0.0083	46.417
506	560	COMB5	-0.0042	-0.0002547	0.007	0.005	-0.0094	52.827
506	561	COMB5	-0.001	0.0306	0.0087	0.0328	-0.0032	75.635
506	562	COMB5	-0.0001691	0.0228	0.0101	0.0267	-0.004	69.3
506	1	COMB6	-0.0124	-0.0154	-0.0378	0.0239	-0.0517	-43.854
506	560	COMB6	0.4872	0.0025	-0.0857	0.5019	-0.0122	-9.739
506	561	COMB6	0.4771	0.5553	-0.1407	0.6622	0.3701	-52.765
506	562	COMB6	0.0015	0.6347	-0.0928	0.648	-0.0118	-81.832
506	1	COMB7	0.0016	0.0012	0.0422	0.0436	-0.0408	44.843
506	560	COMB7	0.0414	-0.0016	0.0459	0.0706	-0.0308	32.46
506	561	COMB7	0.0684	0.0291	0.0474	0.1001	-0.0025	33.737
506	562	COMB7	-0.0014	-0.0023	0.0436	0.0418	-0.0455	44.712
506	1	COMB8	0.0021	0.0021	0.0292	0.0313	-0.0271	45.008
506	560	COMB8	-0.0406	-0.0012	0.0355	0.0197	-0.0615	59.506
506	561	COMB8	-0.0153	-0.0124	0.0414	0.0275	-0.0553	46.017
506	562	COMB8	-0.0012	-0.0318	0.0351	0.0218	-0.0548	33.209
506	1	COMB9	-0.0021	-0.0018	0.0124	0.0105	-0.0144	45.391
506	560	COMB9	0.0517	0.00001413	0.0031	0.0519	-0.0001731	3.439
506	561	COMB9	0.0728	0.1675	-0.0038	0.1676	0.0726	-87.725
506	562	COMB9	-0.0002973	0.176	0.0056	0.1762	-0.0004729	88.193
506	1	COMB10	-0.0009383	0.0004908	0.001	0.001	-0.0015	62.64

506	560	COMB10	-0.0104	0.000004136	-0.0026	0.0006015	-0.011	-76.904
506	561	COMB10	-0.0145	0.0394	-0.0006528	0.0394	-0.0145	-89.305
506	562	COMB10	0.0001387	0.0348	0.0029	0.035	-0.0001065	85.208
506	1	COMB11	-0.0109	-0.0127	-0.0484	0.0366	-0.0603	-44.47
506	560	COMB11	0.4082	0.0024	-0.0896	0.4271	-0.0165	-11.913
506	561	COMB11	0.3747	0.419	-0.1343	0.533	0.2607	-49.686
506	562	COMB11	0.0019	0.4844	-0.0932	0.5017	-0.0155	-79.444
506	1	COMB12	0.0012	0.0009631	0.0381	0.0392	-0.037	44.919
506	560	COMB12	0.045	-0.0014	0.0404	0.0684	-0.0248	30.052
506	561	COMB12	0.0678	0.0371	0.0414	0.0965	0.0083	34.825
506	562	COMB12	-0.0012	0.0075	0.0391	0.0425	-0.0362	48.206
506	1	COMB13	0.0019	0.002	0.0273	0.0293	-0.0254	45.057
506	560	COMB13	-0.0373	-0.0011	0.0329	0.0183	-0.0567	59.391
506	561	COMB13	-0.0141	-0.008	0.0384	0.0275	-0.0496	47.245
506	562	COMB13	-0.0011	-0.0265	0.0329	0.0215	-0.049	34.426
506	1	COMB14	-0.00004864	0.0011	0.008	0.0085	-0.0075	47.019
506	560	COMB14	-0.0266	-0.0003256	0.0074	0.0016	-0.0286	75.364
506	561	COMB14	-0.0227	0.0219	0.0109	0.0245	-0.0252	76.918
506	562	COMB14	-0.0002113	0.0137	0.0116	0.0202	-0.0068	60.452
506	1	COMB15	-0.000936	0.0004728	0.0011	0.0011	-0.0016	60.838
506	560	COMB15	-0.0095	0.000002129	-0.0024	0.0005885	-0.0101	-76.458
506	561	COMB15	-0.0134	0.0396	-0.0005933	0.0396	-0.0135	-89.359
506	562	COMB15	0.0001351	0.035	0.003	0.0352	-0.0001186	85.14
506	1	COMB16	-0.0009679	0.0002686	0.0021	0.0018	-0.0025	53.348
506	560	COMB16	0.0003107	0.000003473	-0.0017	0.0018	-0.0015	-42.379
506	561	COMB16	-0.0033	0.0425	-0.0006239	0.0425	-0.0033	-89.218
506	562	COMB16	0.0001214	0.0377	0.0031	0.038	-0.0001343	85.301
506	1	COMB17	-0.0006681	0.0002997	0.0054	0.0053	-0.0056	47.542
506	560	COMB17	0.0032	-0.0001143	0.0026	0.0046	-0.0016	29.121
506	561	COMB17	0.0029	0.0385	0.0036	0.0389	0.0025	84.3
506	562	COMB17	-0.00001841	0.0323	0.0064	0.0336	-0.0012	79.238
506	1	COMB18	-0.0003968	0.0003778	0.0082	0.0082	-0.0082	46.356
506	560	COMB18	0.0032	-0.0002178	0.0063	0.008	-0.005	37.304
506	561	COMB18	0.0057	0.0343	0.0073	0.036	0.0039	76.459
506	562	COMB18	-0.0001377	0.0269	0.0092	0.0298	-0.003	72.853
506	1	COMB19	-0.0001876	0.0004721	0.0101	0.0102	-0.0099	45.937
506	560	COMB19	0.0016	-0.0002956	0.0088	0.0095	-0.0083	41.986
506	561	COMB19	0.0061	0.0306	0.0101	0.0342	0.0024	70.26
506	562	COMB19	-0.0002249	0.0223	0.0113	0.027	-0.0049	67.422
506	1	COMB20	-0.00008475	0.0005329	0.0109	0.0112	-0.0107	45.81
506	560	COMB20	0.00004194	-0.0003329	0.01	0.0099	-0.0102	44.465
506	561	COMB20	0.0055	0.0286	0.0115	0.0333	0.0007442	67.639
506	562	COMB20	-0.0002656	0.0199	0.0124	0.0258	-0.0061	64.623

506	1	COMB21	-0.00004913	0.0005645	0.0112	0.0114	-0.0109	45.788
506	560	COMB21	-0.001	-0.0003452	0.0104	0.0097	-0.0111	45.912
506	561	COMB21	0.0047	0.0278	0.0119	0.0328	-0.0003492	67.05
506	562	COMB21	-0.0002783	0.019	0.0127	0.0253	-0.0066	63.586
506	1	COMB22	-0.00004274	0.0005806	0.0111	0.0114	-0.0109	45.802
506	560	COMB22	-0.0017	-0.0003468	0.0104	0.0094	-0.0114	46.878
506	561	COMB22	0.004	0.0275	0.012	0.0325	-0.001	67.229
506	562	COMB22	-0.000279	0.0187	0.0127	0.025	-0.0067	63.334
506	1	COMB23	-0.0064	-0.0076	-0.0407	0.0337	-0.0477	-44.607
506	560	COMB23	0.1928	0.0025	-0.0631	0.2118	-0.0165	-16.774
506	561	COMB23	0.171	0.215	-0.0877	0.2834	0.1026	-52.039
506	562	COMB23	0.002	0.2659	-0.0653	0.2811	-0.0132	-76.835
506	1	COMB24	-0.0003385	0.0008105	0.0178	0.0181	-0.0176	45.923
506	560	COMB24	0.0142	-0.0006303	0.0155	0.024	-0.0104	32.209
506	561	COMB24	0.0196	0.0503	0.0175	0.0582	0.0117	65.649
506	562	COMB24	-0.0004352	0.033	0.0197	0.0421	-0.0096	65.112
506	1	COMB25	0.0018	0.0028	0.0323	0.0346	-0.03	45.43
506	560	COMB25	-0.0519	-0.0013	0.0374	0.0185	-0.0718	62.023
506	561	COMB25	-0.0301	-0.0021	0.0457	0.0317	-0.0639	53.526
506	562	COMB25	-0.0012	-0.0283	0.0406	0.0281	-0.0576	35.771
506	1	COMB26	0.0015	0.0024	0.0266	0.0285	-0.0247	45.497
506	560	COMB26	-0.0464	-0.0011	0.0306	0.0143	-0.0618	63.266
506	561	COMB26	-0.0284	0.001	0.0377	0.0268	-0.0542	55.68
506	562	COMB26	-0.0009673	-0.0205	0.0337	0.0244	-0.0458	36.921
506	1	COMB27	0.0008228	0.0017	0.0199	0.0212	-0.0187	45.617
506	560	COMB27	-0.0301	-0.000778	0.0219	0.0109	-0.0419	61.903
506	561	COMB27	-0.0176	0.0116	0.027	0.0277	-0.0336	59.207
506	562	COMB27	-0.0006734	-0.0047	0.0249	0.0223	-0.0277	42.689
506	1	COMB28	-0.0258	-0.0289	-0.1893	0.162	-0.2167	-44.762
506	560	COMB28	0.8011	0.0092	-0.2784	0.8892	-0.0789	-17.557
506	561	COMB28	0.6562	0.7218	-0.3729	1.0633	0.3147	-47.512
506	562	COMB28	0.0083	0.9054	-0.2838	0.9877	-0.074	-73.84
506	1	COMB29	0.0018	0.0044	0.0624	0.0655	-0.0593	45.598
506	560	COMB29	-0.0239	-0.0026	0.0656	0.0532	-0.0798	49.596
506	561	COMB29	0.0048	0.0523	0.0777	0.1098	-0.0528	53.498
506	562	COMB29	-0.0021	-0.0074	0.0745	0.0698	-0.0793	43.97
506	1	COMB30	0.0079	0.0098	0.098	0.1069	-0.0892	45.287
506	560	COMB30	-0.2159	-0.0045	0.1221	0.0513	-0.2716	65.445
506	561	COMB30	-0.1428	-0.1014	0.1516	0.0309	-0.2751	48.886
506	562	COMB30	-0.0041	-0.181	0.1276	0.0627	-0.2478	27.631
506	1	COMB31	0.0058	0.0076	0.0714	0.0781	-0.0647	45.352
506	560	COMB31	-0.1772	-0.0033	0.0893	0.0344	-0.2149	67.12
506	561	COMB31	-0.1233	-0.0773	0.1125	0.0145	-0.2151	50.783

506	562	COMB31	-0.003	-0.1355	0.0946	0.0462	-0.1847	27.492
506	1	COMB32	0.0033	0.0048	0.0453	0.0494	-0.0412	45.466
506	560	COMB32	-0.1109	-0.002	0.0553	0.0211	-0.1341	67.275
506	561	COMB32	-0.0782	-0.0347	0.0701	0.0169	-0.1298	53.626
506	562	COMB32	-0.0018	-0.0723	0.0601	0.0326	-0.1067	29.8
506	1	COMB33	-0.0244	-0.0272	-0.1758	0.15	-0.2016	-44.775
506	560	COMB33	0.7565	0.0085	-0.2606	0.8383	-0.0733	-17.436
506	561	COMB33	0.6221	0.697	-0.3497	1.0112	0.3078	-48.057
506	562	COMB33	0.0077	0.8691	-0.2649	0.944	-0.0673	-74.206
506	1	COMB34	0.0025	0.0054	0.0697	0.0737	-0.0658	45.576
506	560	COMB34	-0.0473	-0.003	0.0753	0.0533	-0.1036	53.208
506	561	COMB34	-0.013	0.0392	0.0902	0.107	-0.0808	53.072
506	562	COMB34	-0.0024	-0.0268	0.0847	0.0709	-0.1002	40.901
506	1	COMB35	0.0083	0.0103	0.1021	0.1114	-0.0928	45.288
506	560	COMB35	-0.2276	-0.0046	0.1274	0.0531	-0.2854	65.601
506	561	COMB35	-0.1514	-0.1084	0.1584	0.0299	-0.2897	48.872
506	562	COMB35	-0.0042	-0.1914	0.1331	0.0649	-0.2605	27.451
506	1	COMB36	0.0061	0.0078	0.0738	0.0808	-0.0669	45.345
506	560	COMB36	-0.1834	-0.0034	0.0925	0.0357	-0.2224	67.111
506	561	COMB36	-0.1276	-0.0814	0.1164	0.0142	-0.2232	50.606
506	562	COMB36	-0.0031	-0.1415	0.0978	0.0475	-0.1921	27.355
506	1	COMB37	0.0035	0.005	0.0468	0.051	-0.0426	45.45
506	560	COMB37	-0.1144	-0.0021	0.0573	0.022	-0.1385	67.209
506	561	COMB37	-0.0804	-0.0373	0.0725	0.0168	-0.1345	53.279
506	562	COMB37	-0.0019	-0.076	0.062	0.0333	-0.1112	29.568
506	1	COMB38	0.0018	0.003	0.0302	0.0326	-0.0278	45.55
506	560	COMB38	-0.0643	-0.0013	0.0354	0.0146	-0.0802	65.83
506	561	COMB38	-0.0438	-0.0072	0.0446	0.0227	-0.0737	56.155
506	562	COMB38	-0.0011	-0.0324	0.0394	0.0256	-0.0591	34.168
506	1	COMB39	0.000955	0.0019	0.0214	0.0228	-0.02	45.612
506	560	COMB39	-0.0348	-0.0008475	0.0238	0.0114	-0.0471	62.755
506	561	COMB39	-0.0213	0.0092	0.0294	0.0271	-0.0392	58.68
506	562	COMB39	-0.0007364	-0.0085	0.027	0.0227	-0.0319	40.935
506	1	COMB40	0.0004456	0.0012	0.0163	0.0171	-0.0155	45.669
506	560	COMB40	-0.0174	-0.0005951	0.0171	0.01	-0.0281	58.093
506	561	COMB40	-0.0078	0.0188	0.0206	0.03	-0.0191	61.388
506	562	COMB40	-0.0005063	0.0055	0.0198	0.0226	-0.0176	49.308
506	1	COMB41	0.0002346	0.0009128	0.0141	0.0147	-0.0135	45.689
506	560	COMB41	-0.0097	-0.0004859	0.0142	0.0098	-0.0201	54.016
506	561	COMB41	-0.0018	0.0226	0.0168	0.0312	-0.0104	62.979
506	562	COMB41	-0.0004086	0.0114	0.0167	0.0232	-0.0122	54.718
506	1	COMB42	0.0001181	0.0007628	0.0129	0.0133	-0.0124	45.718
506	560	COMB42	-0.006	-0.0004263	0.0126	0.0097	-0.0161	51.245

506	561	COMB42	0.001	0.0247	0.0148	0.0318	-0.006	64.374
506	562	COMB42	-0.0003541	0.0145	0.015	0.0238	-0.0097	58.185
506	1	COMB43	0.00005005	0.0006866	0.0121	0.0125	-0.0118	45.752
506	560	COMB43	-0.0042	-0.0003925	0.0117	0.0095	-0.0141	49.686
506	561	COMB43	0.0022	0.0259	0.0136	0.032	-0.0039	65.524
506	562	COMB43	-0.0003221	0.0163	0.014	0.0243	-0.0083	60.288
506	1	COMB44	0.000009063	0.0006473	0.0117	0.012	-0.0114	45.783
506	560	COMB44	-0.0034	-0.0003728	0.0111	0.0093	-0.0131	48.905
506	561	COMB44	0.0027	0.0265	0.0129	0.0322	-0.0029	66.389
506	562	COMB44	-0.0003028	0.0172	0.0135	0.0245	-0.0076	61.547
506	1	COMB45	-0.0017	-0.0023	0.0062	0.0042	-0.0081	43.646
506	560	COMB45	0.0666	0.00025	-0.0008857	0.0667	0.0002382	-0.764
506	561	COMB45	0.0811	0.1207	-0.0092	0.1228	0.0791	-77.557
506	562	COMB45	-0.00007259	0.132	-0.0021	0.1321	-0.0001069	-89.077
506	1	COMB46	0.000111	0.0005199	0.0178	0.0181	-0.0174	45.33
506	560	COMB46	0.018	-0.0005984	0.0172	0.0283	-0.0109	30.801
506	561	COMB46	0.0271	0.0352	0.0181	0.0496	0.0126	51.322
506	562	COMB46	-0.0004959	0.021	0.0186	0.0317	-0.0113	59.97
506	1	COMB47	0.0005528	0.0009832	0.0164	0.0172	-0.0157	45.375
506	560	COMB47	-0.0108	-0.0005922	0.0176	0.0127	-0.0241	53.086
506	561	COMB47	0.0004349	0.017	0.0203	0.0306	-0.0132	56.08
506	562	COMB47	-0.0005307	0.005	0.0191	0.0216	-0.0171	49.135
506	1	COMB48	0.00001062	0.0007431	0.0108	0.0112	-0.0104	45.971
506	560	COMB48	-0.0089	-0.0003622	0.0103	0.0065	-0.0158	56.314
506	561	COMB48	-0.0031	0.025	0.0124	0.0297	-0.0079	69.27
506	562	COMB48	-0.000284	0.0161	0.013	0.0233	-0.0074	61.121
506	1	COMB49	-0.0002775	0.0005605	0.0085	0.0086	-0.0083	46.417
506	560	COMB49	-0.0042	-0.0002547	0.007	0.005	-0.0094	52.827
506	561	COMB49	-0.001	0.0306	0.0087	0.0328	-0.0032	75.635
506	562	COMB49	-0.0001691	0.0228	0.0101	0.0267	-0.004	69.3
506	1	COMB50	-0.0124	-0.0154	-0.0378	0.0239	-0.0517	-43.854
506	560	COMB50	0.4872	0.0025	-0.0857	0.5019	-0.0122	-9.739
506	561	COMB50	0.4771	0.5553	-0.1407	0.6622	0.3701	-52.765
506	562	COMB50	0.0015	0.6347	-0.0928	0.648	-0.0118	-81.832
506	1	COMB51	0.0016	0.0012	0.0422	0.0436	-0.0408	44.843
506	560	COMB51	0.0414	-0.0016	0.0459	0.0706	-0.0308	32.46
506	561	COMB51	0.0684	0.0291	0.0474	0.1001	-0.0025	33.737
506	562	COMB51	-0.0014	-0.0023	0.0436	0.0418	-0.0455	44.712
506	1	COMB52	0.0021	0.0021	0.0292	0.0313	-0.0271	45.008
506	560	COMB52	-0.0406	-0.0012	0.0355	0.0197	-0.0615	59.506
506	561	COMB52	-0.0153	-0.0124	0.0414	0.0275	-0.0553	46.017
506	562	COMB52	-0.0012	-0.0318	0.0351	0.0218	-0.0548	33.209
506	1	COMB53	-0.0021	-0.0018	0.0124	0.0105	-0.0144	45.391

506	560	COMB53	0.0517	0.00001413	0.0031	0.0519	-0.0001731	3.439
506	561	COMB53	0.0728	0.1675	-0.0038	0.1676	0.0726	-87.725
506	562	COMB53	-0.0002973	0.176	0.0056	0.1762	-0.0004729	88.193
506	1	COMB54	-0.0009383	0.0004908	0.001	0.001	-0.0015	62.64
506	560	COMB54	-0.0104	0.000004136	-0.0026	0.0006015	-0.011	-76.904
506	561	COMB54	-0.0145	0.0394	-0.0006528	0.0394	-0.0145	-89.305
506	562	COMB54	0.0001387	0.0348	0.0029	0.035	-0.0001065	85.208
506	1	COMB55	-0.0109	-0.0127	-0.0484	0.0366	-0.0603	-44.47
506	560	COMB55	0.4082	0.0024	-0.0896	0.4271	-0.0165	-11.913
506	561	COMB55	0.3747	0.419	-0.1343	0.533	0.2607	-49.686
506	562	COMB55	0.0019	0.4844	-0.0932	0.5017	-0.0155	-79.444
506	1	COMB56	0.0012	0.0009631	0.0381	0.0392	-0.037	44.919
506	560	COMB56	0.045	-0.0014	0.0404	0.0684	-0.0248	30.052
506	561	COMB56	0.0678	0.0371	0.0414	0.0965	0.0083	34.825
506	562	COMB56	-0.0012	0.0075	0.0391	0.0425	-0.0362	48.206
506	1	COMB57	0.0019	0.002	0.0273	0.0293	-0.0254	45.057
506	560	COMB57	-0.0373	-0.0011	0.0329	0.0183	-0.0567	59.391
506	561	COMB57	-0.0141	-0.008	0.0384	0.0275	-0.0496	47.245
506	562	COMB57	-0.0011	-0.0265	0.0329	0.0215	-0.049	34.426
506	1	COMB58	-0.00004864	0.0011	0.008	0.0085	-0.0075	47.019
506	560	COMB58	-0.0266	-0.0003256	0.0074	0.0016	-0.0286	75.364
506	561	COMB58	-0.0227	0.0219	0.0109	0.0245	-0.0252	76.918
506	562	COMB58	-0.0002113	0.0137	0.0116	0.0202	-0.0068	60.452
506	1	COMB59	-0.000936	0.0004728	0.0011	0.0011	-0.0016	60.838
506	560	COMB59	-0.0095	0.000002129	-0.0024	0.0005885	-0.0101	-76.458
506	561	COMB59	-0.0134	0.0396	-0.0005933	0.0396	-0.0135	-89.359
506	562	COMB59	0.0001351	0.035	0.003	0.0352	-0.0001186	85.14
506	1	COMB60	-0.0009679	0.0002686	0.0021	0.0018	-0.0025	53.348
506	560	COMB60	0.0003107	0.000003473	-0.0017	0.0018	-0.0015	-42.379
506	561	COMB60	-0.0033	0.0425	-0.0006239	0.0425	-0.0033	-89.218
506	562	COMB60	0.0001214	0.0377	0.0031	0.038	-0.0001343	85.301
506	1	COMB61	-0.0006681	0.0002997	0.0054	0.0053	-0.0056	47.542
506	560	COMB61	0.0032	-0.0001143	0.0026	0.0046	-0.0016	29.121
506	561	COMB61	0.0029	0.0385	0.0036	0.0389	0.0025	84.3
506	562	COMB61	-0.00001841	0.0323	0.0064	0.0336	-0.0012	79.238
506	1	COMB62	-0.0003968	0.0003778	0.0082	0.0082	-0.0082	46.356
506	560	COMB62	0.0032	-0.0002178	0.0063	0.008	-0.005	37.304
506	561	COMB62	0.0057	0.0343	0.0073	0.036	0.0039	76.459
506	562	COMB62	-0.0001377	0.0269	0.0092	0.0298	-0.003	72.853
506	1	COMB63	-0.0001876	0.0004721	0.0101	0.0102	-0.0099	45.937
506	560	COMB63	0.0016	-0.0002956	0.0088	0.0095	-0.0083	41.986
506	561	COMB63	0.0061	0.0306	0.0101	0.0342	0.0024	70.26
506	562	COMB63	-0.0002249	0.0223	0.0113	0.027	-0.0049	67.422

506	1	COMB64	-0.00008475	0.0005329	0.0109	0.0112	-0.0107	45.81
506	560	COMB64	0.00004194	-0.0003329	0.01	0.0099	-0.0102	44.465
506	561	COMB64	0.0055	0.0286	0.0115	0.0333	0.0007442	67.639
506	562	COMB64	-0.0002656	0.0199	0.0124	0.0258	-0.0061	64.623
506	1	COMB65	-0.00004913	0.0005645	0.0112	0.0114	-0.0109	45.788
506	560	COMB65	-0.001	-0.0003452	0.0104	0.0097	-0.0111	45.912
506	561	COMB65	0.0047	0.0278	0.0119	0.0328	-0.0003492	67.05
506	562	COMB65	-0.0002783	0.019	0.0127	0.0253	-0.0066	63.586
506	1	COMB66	-0.00004274	0.0005806	0.0111	0.0114	-0.0109	45.802
506	560	COMB66	-0.0017	-0.0003468	0.0104	0.0094	-0.0114	46.878
506	561	COMB66	0.004	0.0275	0.012	0.0325	-0.001	67.229
506	562	COMB66	-0.000279	0.0187	0.0127	0.025	-0.0067	63.334
506	1	COMB67	-0.0064	-0.0076	-0.0407	0.0337	-0.0477	-44.607
506	560	COMB67	0.1928	0.0025	-0.0631	0.2118	-0.0165	-16.774
506	561	COMB67	0.171	0.215	-0.0877	0.2834	0.1026	-52.039
506	562	COMB67	0.002	0.2659	-0.0653	0.2811	-0.0132	-76.835
506	1	COMB68	-0.0003385	0.0008105	0.0178	0.0181	-0.0176	45.923
506	560	COMB68	0.0142	-0.0006303	0.0155	0.024	-0.0104	32.209
506	561	COMB68	0.0196	0.0503	0.0175	0.0582	0.0117	65.649
506	562	COMB68	-0.0004352	0.033	0.0197	0.0421	-0.0096	65.112
506	1	COMB69	0.0018	0.0028	0.0323	0.0346	-0.03	45.43
506	560	COMB69	-0.0519	-0.0013	0.0374	0.0185	-0.0718	62.023
506	561	COMB69	-0.0301	-0.0021	0.0457	0.0317	-0.0639	53.526
506	562	COMB69	-0.0012	-0.0283	0.0406	0.0281	-0.0576	35.771
506	1	COMB70	0.0015	0.0024	0.0266	0.0285	-0.0247	45.497
506	560	COMB70	-0.0464	-0.0011	0.0306	0.0143	-0.0618	63.266
506	561	COMB70	-0.0284	0.001	0.0377	0.0268	-0.0542	55.68
506	562	COMB70	-0.0009673	-0.0205	0.0337	0.0244	-0.0458	36.921
506	1	COMB71	0.0008228	0.0017	0.0199	0.0212	-0.0187	45.617
506	560	COMB71	-0.0301	-0.000778	0.0219	0.0109	-0.0419	61.903
506	561	COMB71	-0.0176	0.0116	0.027	0.0277	-0.0336	59.207
506	562	COMB71	-0.0006734	-0.0047	0.0249	0.0223	-0.0277	42.689
506	1	COMB72	-0.0258	-0.0289	-0.1893	0.162	-0.2167	-44.762
506	560	COMB72	0.8011	0.0092	-0.2784	0.8892	-0.0789	-17.557
506	561	COMB72	0.6562	0.7218	-0.3729	1.0633	0.3147	-47.512
506	562	COMB72	0.0083	0.9054	-0.2838	0.9877	-0.074	-73.84
506	1	COMB73	0.0018	0.0044	0.0624	0.0655	-0.0593	45.598
506	560	COMB73	-0.0239	-0.0026	0.0656	0.0532	-0.0798	49.596
506	561	COMB73	0.0048	0.0523	0.0777	0.1098	-0.0528	53.498
506	562	COMB73	-0.0021	-0.0074	0.0745	0.0698	-0.0793	43.97
506	1	COMB74	0.0079	0.0098	0.098	0.1069	-0.0892	45.287
506	560	COMB74	-0.2159	-0.0045	0.1221	0.0513	-0.2716	65.445
506	561	COMB74	-0.1428	-0.1014	0.1516	0.0309	-0.2751	48.886

506	562	COMB74	-0.0041	-0.181	0.1276	0.0627	-0.2478	27.631
506	1	COMB75	0.0058	0.0076	0.0714	0.0781	-0.0647	45.352
506	560	COMB75	-0.1772	-0.0033	0.0893	0.0344	-0.2149	67.12
506	561	COMB75	-0.1233	-0.0773	0.1125	0.0145	-0.2151	50.783
506	562	COMB75	-0.003	-0.1355	0.0946	0.0462	-0.1847	27.492
506	1	COMB76	0.0033	0.0048	0.0453	0.0494	-0.0412	45.466
506	560	COMB76	-0.1109	-0.002	0.0553	0.0211	-0.1341	67.275
506	561	COMB76	-0.0782	-0.0347	0.0701	0.0169	-0.1298	53.626
506	562	COMB76	-0.0018	-0.0723	0.0601	0.0326	-0.1067	29.8
506	1	COMB77	-0.0244	-0.0272	-0.1758	0.15	-0.2016	-44.775
506	560	COMB77	0.7565	0.0085	-0.2606	0.8383	-0.0733	-17.436
506	561	COMB77	0.6221	0.697	-0.3497	1.0112	0.3078	-48.057
506	562	COMB77	0.0077	0.8691	-0.2649	0.944	-0.0673	-74.206
506	1	COMB78	0.0025	0.0054	0.0697	0.0737	-0.0658	45.576
506	560	COMB78	-0.0473	-0.003	0.0753	0.0533	-0.1036	53.208
506	561	COMB78	-0.013	0.0392	0.0902	0.107	-0.0808	53.072
506	562	COMB78	-0.0024	-0.0268	0.0847	0.0709	-0.1002	40.901
506	1	COMB79	0.0083	0.0103	0.1021	0.1114	-0.0928	45.288
506	560	COMB79	-0.2276	-0.0046	0.1274	0.0531	-0.2854	65.601
506	561	COMB79	-0.1514	-0.1084	0.1584	0.0299	-0.2897	48.872
506	562	COMB79	-0.0042	-0.1914	0.1331	0.0649	-0.2605	27.451
506	1	COMB80	0.0061	0.0078	0.0738	0.0808	-0.0669	45.345
506	560	COMB80	-0.1834	-0.0034	0.0925	0.0357	-0.2224	67.111
506	561	COMB80	-0.1276	-0.0814	0.1164	0.0142	-0.2232	50.606
506	562	COMB80	-0.0031	-0.1415	0.0978	0.0475	-0.1921	27.355
506	1	COMB81	0.0035	0.005	0.0468	0.051	-0.0426	45.45
506	560	COMB81	-0.1144	-0.0021	0.0573	0.022	-0.1385	67.209
506	561	COMB81	-0.0804	-0.0373	0.0725	0.0168	-0.1345	53.279
506	562	COMB81	-0.0019	-0.076	0.062	0.0333	-0.1112	29.568
506	1	COMB82	0.0018	0.003	0.0302	0.0326	-0.0278	45.55
506	560	COMB82	-0.0643	-0.0013	0.0354	0.0146	-0.0802	65.83
506	561	COMB82	-0.0438	-0.0072	0.0446	0.0227	-0.0737	56.155
506	562	COMB82	-0.0011	-0.0324	0.0394	0.0256	-0.0591	34.168
506	1	COMB83	0.000955	0.0019	0.0214	0.0228	-0.02	45.612
506	560	COMB83	-0.0348	-0.0008475	0.0238	0.0114	-0.0471	62.755
506	561	COMB83	-0.0213	0.0092	0.0294	0.0271	-0.0392	58.68
506	562	COMB83	-0.0007364	-0.0085	0.027	0.0227	-0.0319	40.935
506	1	COMB84	0.0004456	0.0012	0.0163	0.0171	-0.0155	45.669
506	560	COMB84	-0.0174	-0.0005951	0.0171	0.01	-0.0281	58.093
506	561	COMB84	-0.0078	0.0188	0.0206	0.03	-0.0191	61.388
506	562	COMB84	-0.0005063	0.0055	0.0198	0.0226	-0.0176	49.308
506	1	COMB85	0.0002346	0.0009128	0.0141	0.0147	-0.0135	45.689
506	560	COMB85	-0.0097	-0.0004859	0.0142	0.0098	-0.0201	54.016

506	561	COMB85	-0.0018	0.0226	0.0168	0.0312	-0.0104	62.979
506	562	COMB85	-0.0004086	0.0114	0.0167	0.0232	-0.0122	54.718
506	1	COMB86	0.0001181	0.0007628	0.0129	0.0133	-0.0124	45.718
506	560	COMB86	-0.006	-0.0004263	0.0126	0.0097	-0.0161	51.245
506	561	COMB86	0.001	0.0247	0.0148	0.0318	-0.006	64.374
506	562	COMB86	-0.0003541	0.0145	0.015	0.0238	-0.0097	58.185
506	1	COMB87	0.00005005	0.0006866	0.0121	0.0125	-0.0118	45.752
506	560	COMB87	-0.0042	-0.0003925	0.0117	0.0095	-0.0141	49.686
506	561	COMB87	0.0022	0.0259	0.0136	0.032	-0.0039	65.524
506	562	COMB87	-0.0003221	0.0163	0.014	0.0243	-0.0083	60.288
506	1	COMB88	0.000009063	0.0006473	0.0117	0.012	-0.0114	45.783
506	560	COMB88	-0.0034	-0.0003728	0.0111	0.0093	-0.0131	48.905
506	561	COMB88	0.0027	0.0265	0.0129	0.0322	-0.0029	66.389
506	562	COMB88	-0.0003028	0.0172	0.0135	0.0245	-0.0076	61.547
506	1	COMB89	-0.0017	-0.0023	0.0062	0.0042	-0.0081	43.646
506	560	COMB89	0.0666	0.00025	-0.0008857	0.0667	0.0002382	-0.764
506	561	COMB89	0.0811	0.1207	-0.0092	0.1228	0.0791	-77.557
506	562	COMB89	-0.00007259	0.132	-0.0021	0.1321	-0.0001069	-89.077
506	1	COMB90	0.000111	0.0005199	0.0178	0.0181	-0.0174	45.33
506	560	COMB90	0.018	-0.0005984	0.0172	0.0283	-0.0109	30.801
506	561	COMB90	0.0271	0.0352	0.0181	0.0496	0.0126	51.322
506	562	COMB90	-0.0004959	0.021	0.0186	0.0317	-0.0113	59.97
506	1	COMB91	0.0005528	0.0009832	0.0164	0.0172	-0.0157	45.375
506	560	COMB91	-0.0108	-0.0005922	0.0176	0.0127	-0.0241	53.086
506	561	COMB91	0.0004349	0.017	0.0203	0.0306	-0.0132	56.08
506	562	COMB91	-0.0005307	0.005	0.0191	0.0216	-0.0171	49.135
506	1	COMB92	0.00001062	0.0007431	0.0108	0.0112	-0.0104	45.971
506	560	COMB92	-0.0089	-0.0003622	0.0103	0.0065	-0.0158	56.314
506	561	COMB92	-0.0031	0.025	0.0124	0.0297	-0.0079	69.27
506	562	COMB92	-0.000284	0.0161	0.013	0.0233	-0.0074	61.121
506	1	COMB93	-0.0002775	0.0005605	0.0085	0.0086	-0.0083	46.417
506	560	COMB93	-0.0042	-0.0002547	0.007	0.005	-0.0094	52.827
506	561	COMB93	-0.001	0.0306	0.0087	0.0328	-0.0032	75.635
506	562	COMB93	-0.0001691	0.0228	0.0101	0.0267	-0.004	69.3
506	1	COMB94	-0.0124	-0.0154	-0.0378	0.0239	-0.0517	-43.854
506	560	COMB94	0.4872	0.0025	-0.0857	0.5019	-0.0122	-9.739
506	561	COMB94	0.4771	0.5553	-0.1407	0.6622	0.3701	-52.765
506	562	COMB94	0.0015	0.6347	-0.0928	0.648	-0.0118	-81.832
506	1	COMB95	0.0016	0.0012	0.0422	0.0436	-0.0408	44.843
506	560	COMB95	0.0414	-0.0016	0.0459	0.0706	-0.0308	32.46
506	561	COMB95	0.0684	0.0291	0.0474	0.1001	-0.0025	33.737
506	562	COMB95	-0.0014	-0.0023	0.0436	0.0418	-0.0455	44.712
506	1	COMB96	0.0021	0.0021	0.0292	0.0313	-0.0271	45.008

506	560	COMB96	-0.0406	-0.0012	0.0355	0.0197	-0.0615	59.506
506	561	COMB96	-0.0153	-0.0124	0.0414	0.0275	-0.0553	46.017
506	562	COMB96	-0.0012	-0.0318	0.0351	0.0218	-0.0548	33.209
506	1	COMB97	-0.0021	-0.0018	0.0124	0.0105	-0.0144	45.391
506	560	COMB97	0.0517	0.00001413	0.0031	0.0519	-0.0001731	3.439
506	561	COMB97	0.0728	0.1675	-0.0038	0.1676	0.0726	-87.725
506	562	COMB97	-0.0002973	0.176	0.0056	0.1762	-0.0004729	88.193
506	1	COMB98	-0.0009383	0.0004908	0.001	0.001	-0.0015	62.64
506	560	COMB98	-0.0104	0.000004136	-0.0026	0.0006015	-0.011	-76.904
506	561	COMB98	-0.0145	0.0394	-0.0006528	0.0394	-0.0145	-89.305
506	562	COMB98	0.0001387	0.0348	0.0029	0.035	-0.0001065	85.208
506	1	COMB99	-0.0109	-0.0127	-0.0484	0.0366	-0.0603	-44.47
506	560	COMB99	0.4082	0.0024	-0.0896	0.4271	-0.0165	-11.913
506	561	COMB99	0.3747	0.419	-0.1343	0.533	0.2607	-49.686
506	562	COMB99	0.0019	0.4844	-0.0932	0.5017	-0.0155	-79.444
506	1	COMB100	0.0012	0.0009631	0.0381	0.0392	-0.037	44.919
506	560	COMB100	0.045	-0.0014	0.0404	0.0684	-0.0248	30.052
506	561	COMB100	0.0678	0.0371	0.0414	0.0965	0.0083	34.825
506	562	COMB100	-0.0012	0.0075	0.0391	0.0425	-0.0362	48.206
506	1	COMB101	0.0019	0.002	0.0273	0.0293	-0.0254	45.057
506	560	COMB101	-0.0373	-0.0011	0.0329	0.0183	-0.0567	59.391
506	561	COMB101	-0.0141	-0.008	0.0384	0.0275	-0.0496	47.245
506	562	COMB101	-0.0011	-0.0265	0.0329	0.0215	-0.049	34.426
506	1	COMB102	-0.00004864	0.0011	0.008	0.0085	-0.0075	47.019
506	560	COMB102	-0.0266	-0.0003256	0.0074	0.0016	-0.0286	75.364
506	561	COMB102	-0.0227	0.0219	0.0109	0.0245	-0.0252	76.918
506	562	COMB102	-0.0002113	0.0137	0.0116	0.0202	-0.0068	60.452
506	1	COMB103	-0.000936	0.0004728	0.0011	0.0011	-0.0016	60.838
506	560	COMB103	-0.0095	0.000002129	-0.0024	0.0005885	-0.0101	-76.458
506	561	COMB103	-0.0134	0.0396	-0.0005933	0.0396	-0.0135	-89.359
506	562	COMB103	0.0001351	0.035	0.003	0.0352	-0.0001186	85.14
506	1	COMB104	-0.0009679	0.0002686	0.0021	0.0018	-0.0025	53.348
506	560	COMB104	0.0003107	0.000003473	-0.0017	0.0018	-0.0015	-42.379
506	561	COMB104	-0.0033	0.0425	-0.0006239	0.0425	-0.0033	-89.218
506	562	COMB104	0.0001214	0.0377	0.0031	0.038	-0.0001343	85.301
506	1	COMB105	-0.0006681	0.0002997	0.0054	0.0053	-0.0056	47.542
506	560	COMB105	0.0032	-0.0001143	0.0026	0.0046	-0.0016	29.121
506	561	COMB105	0.0029	0.0385	0.0036	0.0389	0.0025	84.3
506	562	COMB105	-0.00001841	0.0323	0.0064	0.0336	-0.0012	79.238
506	1	COMB106	-0.0003968	0.0003778	0.0082	0.0082	-0.0082	46.356
506	560	COMB106	0.0032	-0.0002178	0.0063	0.008	-0.005	37.304
506	561	COMB106	0.0057	0.0343	0.0073	0.036	0.0039	76.459
506	562	COMB106	-0.0001377	0.0269	0.0092	0.0298	-0.003	72.853

506	1	COMB107	-0.0001876	0.0004721	0.0101	0.0102	-0.0099	45.937
506	560	COMB107	0.0016	-0.0002956	0.0088	0.0095	-0.0083	41.986
506	561	COMB107	0.0061	0.0306	0.0101	0.0342	0.0024	70.26
506	562	COMB107	-0.0002249	0.0223	0.0113	0.027	-0.0049	67.422
506	1	COMB108	-0.00008475	0.0005329	0.0109	0.0112	-0.0107	45.81
506	560	COMB108	0.00004194	-0.0003329	0.01	0.0099	-0.0102	44.465
506	561	COMB108	0.0055	0.0286	0.0115	0.0333	0.0007442	67.639
506	562	COMB108	-0.0002656	0.0199	0.0124	0.0258	-0.0061	64.623
506	1	COMB109	-0.00004913	0.0005645	0.0112	0.0114	-0.0109	45.788
506	560	COMB109	-0.001	-0.0003452	0.0104	0.0097	-0.0111	45.912
506	561	COMB109	0.0047	0.0278	0.0119	0.0328	-0.0003492	67.05
506	562	COMB109	-0.0002783	0.019	0.0127	0.0253	-0.0066	63.586
506	1	COMB110	-0.00004274	0.0005806	0.0111	0.0114	-0.0109	45.802
506	560	COMB110	-0.0017	-0.0003468	0.0104	0.0094	-0.0114	46.878
506	561	COMB110	0.004	0.0275	0.012	0.0325	-0.001	67.229
506	562	COMB110	-0.000279	0.0187	0.0127	0.025	-0.0067	63.334
506	1	COMB111	-0.0064	-0.0076	-0.0407	0.0337	-0.0477	-44.607
506	560	COMB111	0.1928	0.0025	-0.0631	0.2118	-0.0165	-16.774
506	561	COMB111	0.171	0.215	-0.0877	0.2834	0.1026	-52.039
506	562	COMB111	0.002	0.2659	-0.0653	0.2811	-0.0132	-76.835
506	1	COMB112	-0.0003385	0.0008105	0.0178	0.0181	-0.0176	45.923
506	560	COMB112	0.0142	-0.0006303	0.0155	0.024	-0.0104	32.209
506	561	COMB112	0.0196	0.0503	0.0175	0.0582	0.0117	65.649
506	562	COMB112	-0.0004352	0.033	0.0197	0.0421	-0.0096	65.112
506	1	COMB113	0.0018	0.0028	0.0323	0.0346	-0.03	45.43
506	560	COMB113	-0.0519	-0.0013	0.0374	0.0185	-0.0718	62.023
506	561	COMB113	-0.0301	-0.0021	0.0457	0.0317	-0.0639	53.526
506	562	COMB113	-0.0012	-0.0283	0.0406	0.0281	-0.0576	35.771
506	1	COMB114	0.0015	0.0024	0.0266	0.0285	-0.0247	45.497
506	560	COMB114	-0.0464	-0.0011	0.0306	0.0143	-0.0618	63.266
506	561	COMB114	-0.0284	0.001	0.0377	0.0268	-0.0542	55.68
506	562	COMB114	-0.0009673	-0.0205	0.0337	0.0244	-0.0458	36.921
506	1	COMB115	0.0008228	0.0017	0.0199	0.0212	-0.0187	45.617
506	560	COMB115	-0.0301	-0.000778	0.0219	0.0109	-0.0419	61.903
506	561	COMB115	-0.0176	0.0116	0.027	0.0277	-0.0336	59.207
506	562	COMB115	-0.0006734	-0.0047	0.0249	0.0223	-0.0277	42.689
506	1	COMB116	-0.0258	-0.0289	-0.1893	0.162	-0.2167	-44.762
506	560	COMB116	0.8011	0.0092	-0.2784	0.8892	-0.0789	-17.557
506	561	COMB116	0.6562	0.7218	-0.3729	1.0633	0.3147	-47.512
506	562	COMB116	0.0083	0.9054	-0.2838	0.9877	-0.074	-73.84
506	1	COMB117	0.0018	0.0044	0.0624	0.0655	-0.0593	45.598
506	560	COMB117	-0.0239	-0.0026	0.0656	0.0532	-0.0798	49.596
506	561	COMB117	0.0048	0.0523	0.0777	0.1098	-0.0528	53.498

506	562	COMB117	-0.0021	-0.0074	0.0745	0.0698	-0.0793	43.97
506	1	COMB118	0.0079	0.0098	0.098	0.1069	-0.0892	45.287
506	560	COMB118	-0.2159	-0.0045	0.1221	0.0513	-0.2716	65.445
506	561	COMB118	-0.1428	-0.1014	0.1516	0.0309	-0.2751	48.886
506	562	COMB118	-0.0041	-0.181	0.1276	0.0627	-0.2478	27.631
506	1	COMB119	0.0058	0.0076	0.0714	0.0781	-0.0647	45.352
506	560	COMB119	-0.1772	-0.0033	0.0893	0.0344	-0.2149	67.12
506	561	COMB119	-0.1233	-0.0773	0.1125	0.0145	-0.2151	50.783
506	562	COMB119	-0.003	-0.1355	0.0946	0.0462	-0.1847	27.492
506	1	COMB120	0.0033	0.0048	0.0453	0.0494	-0.0412	45.466
506	560	COMB120	-0.1109	-0.002	0.0553	0.0211	-0.1341	67.275
506	561	COMB120	-0.0782	-0.0347	0.0701	0.0169	-0.1298	53.626
506	562	COMB120	-0.0018	-0.0723	0.0601	0.0326	-0.1067	29.8
506	1	COMB121	-0.0244	-0.0272	-0.1758	0.15	-0.2016	-44.775
506	560	COMB121	0.7565	0.0085	-0.2606	0.8383	-0.0733	-17.436
506	561	COMB121	0.6221	0.697	-0.3497	1.0112	0.3078	-48.057
506	562	COMB121	0.0077	0.8691	-0.2649	0.944	-0.0673	-74.206
506	1	COMB122	0.0025	0.0054	0.0697	0.0737	-0.0658	45.576
506	560	COMB122	-0.0473	-0.003	0.0753	0.0533	-0.1036	53.208
506	561	COMB122	-0.013	0.0392	0.0902	0.107	-0.0808	53.072
506	562	COMB122	-0.0024	-0.0268	0.0847	0.0709	-0.1002	40.901
506	1	COMB123	0.0083	0.0103	0.1021	0.1114	-0.0928	45.288
506	560	COMB123	-0.2276	-0.0046	0.1274	0.0531	-0.2854	65.601
506	561	COMB123	-0.1514	-0.1084	0.1584	0.0299	-0.2897	48.872
506	562	COMB123	-0.0042	-0.1914	0.1331	0.0649	-0.2605	27.451
506	1	COMB124	0.0061	0.0078	0.0738	0.0808	-0.0669	45.345
506	560	COMB124	-0.1834	-0.0034	0.0925	0.0357	-0.2224	67.111
506	561	COMB124	-0.1276	-0.0814	0.1164	0.0142	-0.2232	50.606
506	562	COMB124	-0.0031	-0.1415	0.0978	0.0475	-0.1921	27.355
506	1	COMB125	0.0035	0.005	0.0468	0.051	-0.0426	45.45
506	560	COMB125	-0.1144	-0.0021	0.0573	0.022	-0.1385	67.209
506	561	COMB125	-0.0804	-0.0373	0.0725	0.0168	-0.1345	53.279
506	562	COMB125	-0.0019	-0.076	0.062	0.0333	-0.1112	29.568
506	1	COMB126	0.0018	0.003	0.0302	0.0326	-0.0278	45.55
506	560	COMB126	-0.0643	-0.0013	0.0354	0.0146	-0.0802	65.83
506	561	COMB126	-0.0438	-0.0072	0.0446	0.0227	-0.0737	56.155
506	562	COMB126	-0.0011	-0.0324	0.0394	0.0256	-0.0591	34.168
506	1	COMB127	0.000955	0.0019	0.0214	0.0228	-0.02	45.612
506	560	COMB127	-0.0348	-0.0008475	0.0238	0.0114	-0.0471	62.755
506	561	COMB127	-0.0213	0.0092	0.0294	0.0271	-0.0392	58.68
506	562	COMB127	-0.0007364	-0.0085	0.027	0.0227	-0.0319	40.935
506	1	COMB128	0.0004456	0.0012	0.0163	0.0171	-0.0155	45.669
506	560	COMB128	-0.0174	-0.0005951	0.0171	0.01	-0.0281	58.093

506	561	COMB128	-0.0078	0.0188	0.0206	0.03	-0.0191	61.388
506	562	COMB128	-0.0005063	0.0055	0.0198	0.0226	-0.0176	49.308
506	1	COMB129	0.0002346	0.0009128	0.0141	0.0147	-0.0135	45.689
506	560	COMB129	-0.0097	-0.0004859	0.0142	0.0098	-0.0201	54.016
506	561	COMB129	-0.0018	0.0226	0.0168	0.0312	-0.0104	62.979
506	562	COMB129	-0.0004086	0.0114	0.0167	0.0232	-0.0122	54.718
506	1	COMB130	0.0001181	0.0007628	0.0129	0.0133	-0.0124	45.718
506	560	COMB130	-0.006	-0.0004263	0.0126	0.0097	-0.0161	51.245
506	561	COMB130	0.001	0.0247	0.0148	0.0318	-0.006	64.374
506	562	COMB130	-0.0003541	0.0145	0.015	0.0238	-0.0097	58.185
506	1	COMB131	0.00005005	0.0006866	0.0121	0.0125	-0.0118	45.752
506	560	COMB131	-0.0042	-0.0003925	0.0117	0.0095	-0.0141	49.686
506	561	COMB131	0.0022	0.0259	0.0136	0.032	-0.0039	65.524
506	562	COMB131	-0.0003221	0.0163	0.014	0.0243	-0.0083	60.288
506	1	COMB132	0.000009063	0.0006473	0.0117	0.012	-0.0114	45.783
506	560	COMB132	-0.0034	-0.0003728	0.0111	0.0093	-0.0131	48.905
506	561	COMB132	0.0027	0.0265	0.0129	0.0322	-0.0029	66.389
506	562	COMB132	-0.0003028	0.0172	0.0135	0.0245	-0.0076	61.547
900	873	COMB1	-0.9896	0.1738	0.0028	0.1738	-0.9896	89.864
900	122	COMB1	-0.9464	0.1756	0.0056	0.1757	-0.9464	89.716
900	877	COMB1	-0.9224	0.2631	0.0029	0.2631	-0.9224	89.861
900	875	COMB1	-0.965	0.2603	0.000078	0.2603	-0.965	89.996
900	873	COMB2	0.1362	0.3028	-0.0565	0.3201	0.1189	-72.925
900	122	COMB2	0.026	0.2676	-0.0566	0.2802	0.0135	-77.454
900	877	COMB2	0.046	0.3605	-0.0627	0.3726	0.0339	-79.132
900	875	COMB2	0.1534	0.3976	-0.0626	0.4127	0.1383	-76.42
900	873	COMB3	2.1011	1.0123	-0.0005857	2.1011	1.0123	-0.031
900	122	COMB3	1.8292	0.9179	0.0067	1.8292	0.9179	0.419
900	877	COMB3	1.8707	1.0842	-0.0096	1.8708	1.084	-0.7
900	875	COMB3	2.1619	1.1784	-0.0169	2.1622	1.1781	-0.982
900	873	COMB4	0.4491	0.3168	0.0388	0.4596	0.3063	15.198
900	122	COMB4	0.5738	0.3642	0.0366	0.58	0.3579	9.622
900	877	COMB4	0.5864	0.4657	0.0471	0.6026	0.4495	18.984
900	875	COMB4	0.4655	0.415	0.0493	0.4956	0.3848	31.437
900	873	COMB5	-0.1163	0.1948	0.0334	0.1983	-0.1199	83.941
900	122	COMB5	-0.0892	0.199	0.0356	0.2033	-0.0935	83.071
900	877	COMB5	-0.0653	0.2917	0.035	0.2951	-0.0687	84.452
900	875	COMB5	-0.0925	0.2876	0.0329	0.2904	-0.0953	85.095
900	873	COMB6	-5.2503	0.2038	-0.0262	0.204	-5.2504	-89.725
900	122	COMB6	-5.1091	0.2018	-0.0093	0.2018	-5.1091	-89.9
900	877	COMB6	-5.0379	0.3561	-0.0213	0.3562	-5.038	-89.774
900	875	COMB6	-5.1772	0.354	-0.0382	0.3542	-5.1774	-89.605
900	873	COMB7	0.905	0.7345	-0.2196	1.0553	0.5842	-34.39

900	122	COMB7	0.3433	0.5422	-0.2257	0.6894	0.1961	-56.89
900	877	COMB7	0.3534	0.6232	-0.2636	0.7845	0.1922	-58.551
900	875	COMB7	0.9	0.8295	-0.2575	1.1247	0.6048	-41.098
900	873	COMB8	7.1951	3.04	-0.1446	7.2002	3.0349	-1.99
900	122	COMB8	8.1757	3.418	-0.1152	8.1785	3.4152	-1.386
900	877	COMB8	8.3615	3.7875	-0.0409	8.3619	3.7872	-0.512
900	875	COMB8	7.3025	3.411	-0.0702	7.3038	3.4097	-1.033
900	873	COMB9	-0.2555	0.647	0.1764	0.6802	-0.2888	79.327
900	122	COMB9	0.2269	0.7945	0.1773	0.8453	0.1761	74.002
900	877	COMB9	0.2627	0.9965	0.2018	1.0483	0.2109	75.598
900	875	COMB9	-0.2077	0.8395	0.2008	0.8767	-0.2449	79.509
900	873	COMB10	-0.8329	0.1003	0.1186	0.1151	-0.8477	82.87
900	122	COMB10	-0.7554	0.11	0.1272	0.1283	-0.7737	81.811
900	877	COMB10	-0.7192	0.1832	0.1245	0.2001	-0.7361	82.285
900	875	COMB10	-0.7972	0.1741	0.116	0.1878	-0.8108	83.285
900	873	COMB11	-4.794	-0.0571	-0.0116	-0.0571	-4.794	-89.86
900	122	COMB11	-4.7575	-0.0696	0.0056	-0.0696	-4.7575	89.932
900	877	COMB11	-4.709	-0.0376	-0.0026	-0.0376	-4.709	-89.969
900	875	COMB11	-4.7453	-0.0267	-0.0197	-0.0266	-4.7453	-89.761
900	873	COMB12	0.3221	0.7068	-0.2334	0.8169	0.212	-64.751
900	122	COMB12	-0.2986	0.5082	-0.238	0.5732	-0.3636	-74.729
900	877	COMB12	-0.2862	0.5817	-0.2739	0.6609	-0.3654	-73.871
900	875	COMB12	0.3189	0.7954	-0.2692	0.9166	0.1976	-65.754
900	873	COMB13	6.9109	3.0401	-0.1669	6.9181	3.0329	-2.464
900	122	COMB13	7.849	3.415	-0.1376	7.8532	3.4107	-1.775
900	877	COMB13	8.0344	3.7825	-0.0611	8.0353	3.7817	-0.823
900	875	COMB13	7.0178	3.4097	-0.0904	7.0201	3.4075	-1.434
900	873	COMB14	0.9899	0.4695	0.1537	1.0319	0.4275	15.29
900	122	COMB14	1.3934	0.6138	0.1504	1.4214	0.5858	10.552
900	877	COMB14	1.3979	0.7095	0.1799	1.442	0.6653	13.797
900	875	COMB14	1.0057	0.5572	0.1832	1.071	0.4919	19.623
900	873	COMB15	-0.8145	0.1107	0.1082	0.1231	-0.8269	83.418
900	122	COMB15	-0.7429	0.1208	0.1162	0.1361	-0.7583	82.469
900	877	COMB15	-0.7079	0.1956	0.1143	0.2098	-0.7221	82.902
900	875	COMB15	-0.7798	0.186	0.1063	0.1976	-0.7914	83.796
900	873	COMB16	-1.0429	0.1288	0.0251	0.1293	-1.0434	88.775
900	122	COMB16	-1.1009	0.119	0.0301	0.1198	-1.1016	88.587
900	877	COMB16	-1.0717	0.1988	0.0305	0.1995	-1.0724	88.626
900	875	COMB16	-1.0149	0.2102	0.0254	0.2108	-1.0154	88.811
900	873	COMB17	-0.6785	0.1856	-0.0162	0.1859	-0.6789	-88.923
900	122	COMB17	-0.7526	0.1774	-0.0144	0.1776	-0.7528	-89.114
900	877	COMB17	-0.7297	0.2667	-0.0119	0.2669	-0.7298	-89.318
900	875	COMB17	-0.6563	0.2763	-0.0137	0.2765	-0.6565	-89.157

900	873	COMB18	-0.3231	0.2219	-0.0303	0.2236	-0.3248	-86.825
900	122	COMB18	-0.3828	0.2174	-0.0303	0.2189	-0.3843	-87.113
900	877	COMB18	-0.3634	0.3136	-0.0274	0.3147	-0.3645	-87.688
900	875	COMB18	-0.304	0.319	-0.0274	0.3202	-0.3052	-87.491
900	873	COMB19	-0.0411	0.2366	-0.0251	0.2388	-0.0433	-84.883
900	122	COMB19	-0.0717	0.2353	-0.0258	0.2375	-0.0739	-85.223
900	877	COMB19	-0.0536	0.3355	-0.0238	0.337	-0.055	-86.511
900	875	COMB19	-0.023	0.3371	-0.023	0.3386	-0.0244	-86.355
900	873	COMB20	0.0924	0.2369	-0.015	0.2385	0.0909	-84.123
900	122	COMB20	0.082	0.2372	-0.0158	0.2388	0.0804	-84.237
900	877	COMB20	0.1003	0.3385	-0.0148	0.3394	0.0994	-86.458
900	875	COMB20	0.1108	0.3382	-0.014	0.339	0.1099	-86.488
900	873	COMB21	0.1339	0.2319	-0.0061	0.2323	0.1335	-86.463
900	122	COMB21	0.1347	0.2327	-0.0066	0.2331	0.1342	-86.161
900	877	COMB21	0.1535	0.3336	-0.0063	0.3338	0.1533	-87.991
900	875	COMB21	0.1528	0.3327	-0.0058	0.3329	0.1526	-88.155
900	873	COMB22	0.1385	0.2262	0.0008189	0.2262	0.1385	89.465
900	122	COMB22	0.1457	0.227	0.0005952	0.227	0.1457	89.58
900	877	COMB22	0.1652	0.3272	0.0003501	0.3272	0.1652	89.876
900	875	COMB22	0.158	0.3262	0.0005738	0.3262	0.158	89.805
900	873	COMB23	-0.6565	0.175	-0.2536	0.2463	-0.7278	-74.307
900	122	COMB23	-0.63	0.1696	-0.2451	0.2387	-0.6991	-74.244
900	877	COMB23	-0.59	0.2645	-0.2497	0.3322	-0.6576	-74.847
900	875	COMB23	-0.6162	0.2703	-0.2583	0.34	-0.686	-74.885
900	873	COMB24	0.1055	0.3637	-0.2398	0.507	-0.0378	-59.145
900	122	COMB24	0.0132	0.3195	-0.2419	0.4527	-0.12	-61.171
900	877	COMB24	0.0323	0.4261	-0.2539	0.5505	-0.0922	-63.895
900	875	COMB24	0.1193	0.4738	-0.2518	0.6045	-0.0114	-62.569
900	873	COMB25	1.8755	1.1148	-0.036	1.8772	1.1131	-2.701
900	122	COMB25	1.6123	1.02	-0.0388	1.6148	1.0175	-3.728
900	877	COMB25	1.6335	1.2081	-0.056	1.6408	1.2009	-7.381
900	875	COMB25	1.9158	1.303	-0.0533	1.9204	1.2984	-4.931
900	873	COMB26	0.3019	0.3821	0.1398	0.4874	0.1966	53.002
900	122	COMB26	0.4131	0.4387	0.1329	0.5594	0.2924	47.754
900	877	COMB26	0.4156	0.5558	0.149	0.6504	0.321	57.599
900	875	COMB26	0.3112	0.4941	0.1559	0.5834	0.2219	60.201
900	873	COMB27	-0.1163	0.2092	0.1595	0.2743	-0.1814	67.788
900	122	COMB27	-0.0972	0.2197	0.1633	0.2887	-0.1663	67.068
900	877	COMB27	-0.0685	0.3191	0.1664	0.3807	-0.1301	69.68
900	875	COMB27	-0.0865	0.3079	0.1625	0.3662	-0.1448	70.248
900	873	COMB28	-2.7446	0.0425	-0.9381	0.3289	-3.031	-73.026
900	122	COMB28	-2.7	0.0095	-0.9022	0.2824	-2.9729	-73.17
900	877	COMB28	-2.5938	0.0921	-0.9207	0.3774	-2.8791	-72.783

900	875	COMB28	-2.6396	0.1273	-0.9566	0.4258	-2.9382	-72.668
900	873	COMB29	0.658	1.0042	-0.8319	1.6808	-0.0186	-50.878
900	122	COMB29	0.1816	0.7771	-0.8497	1.3798	-0.421	-54.655
900	877	COMB29	0.1814	0.9198	-0.9118	1.5343	-0.4332	-56.021
900	875	COMB29	0.6312	1.1675	-0.894	1.8327	-0.034	-53.348
900	873	COMB30	6.2881	3.4394	-0.1485	6.2958	3.4317	-2.977
900	122	COMB30	7.2921	3.8237	-0.1585	7.2993	3.8164	-2.612
900	877	COMB30	7.3974	4.2824	-0.0832	7.3996	4.2802	-1.529
900	875	COMB30	6.317	3.8984	-0.0732	6.3192	3.8962	-1.732
900	873	COMB31	0.5635	0.6795	0.644	1.2681	-0.025	47.573
900	122	COMB31	0.9328	0.862	0.6283	1.5267	0.268	43.388
900	877	COMB31	0.9115	1.0129	0.6791	1.6431	0.2812	47.134
900	875	COMB31	0.565	0.8157	0.6947	1.3963	-0.0155	50.114
900	873	COMB32	-0.785	0.1323	0.632	0.4546	-1.1072	62.984
900	122	COMB32	-0.7327	0.1643	0.6496	0.5052	-1.0736	62.31
900	877	COMB32	-0.6714	0.2613	0.6595	0.6027	-1.0128	62.633
900	875	COMB32	-0.7209	0.2269	0.6419	0.5508	-1.0449	63.218
900	873	COMB33	-3.4344	-0.0658	-0.6334	0.0493	-3.5496	-79.695
900	122	COMB33	-3.4254	-0.1015	-0.5844	-0.0018	-3.5252	-80.313
900	877	COMB33	-3.2879	-0.0271	-0.6011	0.0802	-3.3951	-79.881
900	875	COMB33	-3.2994	0.0109	-0.6501	0.134	-3.4225	-79.278
900	873	COMB34	0.2017	0.9322	-0.6605	1.3217	-0.1878	-59.472
900	122	COMB34	-0.316	0.6994	-0.6699	1.0322	-0.6489	-63.579
900	877	COMB34	-0.2958	0.8363	-0.7311	1.1948	-0.6544	-63.874
900	875	COMB34	0.194	1.0903	-0.7217	1.4916	-0.2074	-60.919
900	873	COMB35	6.0522	3.4028	-0.0608	6.0536	3.4015	-1.313
900	122	COMB35	7.0271	3.7831	-0.0662	7.0284	3.7817	-1.168
900	877	COMB35	7.1437	4.2393	0.0098	7.1438	4.2392	0.194
900	875	COMB35	6.0914	3.8597	0.0152	6.0915	3.8595	0.391
900	873	COMB36	0.4722	0.6629	0.6897	1.2638	-0.1287	48.937
900	122	COMB36	0.8263	0.8434	0.6764	1.5113	0.1584	45.36
900	877	COMB36	0.811	0.9936	0.7275	1.6355	0.1691	48.576
900	875	COMB36	0.4791	0.7987	0.7408	1.3967	-0.1189	51.087
900	873	COMB37	-0.8051	0.1249	0.6572	0.465	-1.1452	62.64
900	122	COMB37	-0.7585	0.156	0.6761	0.5149	-1.1175	62.036
900	877	COMB37	-0.6941	0.2531	0.686	0.6131	-1.0541	62.311
900	875	COMB37	-0.7382	0.2196	0.6672	0.562	-1.0805	62.835
900	873	COMB38	-0.8466	0.0744	0.4281	0.2426	-1.0148	68.545
900	122	COMB38	-0.8937	0.0711	0.4462	0.2459	-1.0684	68.616
900	877	COMB38	-0.8301	0.1597	0.4488	0.3329	-1.0033	68.9
900	875	COMB38	-0.7848	0.1632	0.4306	0.3295	-0.9512	68.874
900	873	COMB39	-0.5369	0.1216	0.2443	0.2023	-0.6177	71.714
900	122	COMB39	-0.5917	0.1137	0.2562	0.1969	-0.6749	72.003

900	877	COMB39	-0.5429	0.2051	0.2573	0.285	-0.6229	72.739
900	875	COMB39	-0.4902	0.2137	0.2454	0.2908	-0.5673	72.558
900	873	COMB40	-0.2537	0.1726	0.1197	0.2039	-0.285	75.339
900	122	COMB40	-0.295	0.167	0.1259	0.1991	-0.3271	75.699
900	877	COMB40	-0.2598	0.2625	0.1269	0.2917	-0.289	77.043
900	875	COMB40	-0.2198	0.2687	0.1207	0.2969	-0.248	76.855
900	873	COMB41	-0.0564	0.2001	0.062	0.2143	-0.0706	77.107
900	122	COMB41	-0.079	0.1971	0.0651	0.2117	-0.0936	77.366
900	877	COMB41	-0.051	0.2953	0.0657	0.3073	-0.0631	79.613
900	875	COMB41	-0.0292	0.2986	0.0625	0.3101	-0.0407	79.562
900	873	COMB42	0.0421	0.2127	0.0337	0.2191	0.0357	79.233
900	122	COMB42	0.0323	0.2113	0.0353	0.2181	0.0256	79.241
900	877	COMB42	0.0564	0.3107	0.0355	0.3155	0.0515	82.199
900	875	COMB42	0.0658	0.3121	0.0339	0.3167	0.0612	82.312
900	873	COMB43	0.0795	0.2172	0.0208	0.2202	0.0765	81.608
900	122	COMB43	0.0768	0.2165	0.0217	0.2198	0.0735	81.379
900	877	COMB43	0.0991	0.316	0.0216	0.3182	0.097	84.36
900	875	COMB43	0.1016	0.3167	0.0207	0.3186	0.0996	84.549
900	873	COMB44	0.0905	0.218	0.0152	0.2198	0.0887	83.306
900	122	COMB44	0.0919	0.2177	0.0158	0.2197	0.0899	82.952
900	877	COMB44	0.1133	0.3171	0.0156	0.3183	0.1122	85.656
900	875	COMB44	0.1119	0.3173	0.0149	0.3184	0.1108	85.864
900	873	COMB45	-0.9896	0.1738	0.0028	0.1738	-0.9896	89.864
900	122	COMB45	-0.9464	0.1756	0.0056	0.1757	-0.9464	89.716
900	877	COMB45	-0.9224	0.2631	0.0029	0.2631	-0.9224	89.861
900	875	COMB45	-0.965	0.2603	0.000078	0.2603	-0.965	89.996
900	873	COMB46	0.1362	0.3028	-0.0565	0.3201	0.1189	-72.925
900	122	COMB46	0.026	0.2676	-0.0566	0.2802	0.0135	-77.454
900	877	COMB46	0.046	0.3605	-0.0627	0.3726	0.0339	-79.132
900	875	COMB46	0.1534	0.3976	-0.0626	0.4127	0.1383	-76.42
900	873	COMB47	2.1011	1.0123	-0.0005857	2.1011	1.0123	-0.031
900	122	COMB47	1.8292	0.9179	0.0067	1.8292	0.9179	0.419
900	877	COMB47	1.8707	1.0842	-0.0096	1.8708	1.084	-0.7
900	875	COMB47	2.1619	1.1784	-0.0169	2.1622	1.1781	-0.982
900	873	COMB48	0.4491	0.3168	0.0388	0.4596	0.3063	15.198
900	122	COMB48	0.5738	0.3642	0.0366	0.58	0.3579	9.622
900	877	COMB48	0.5864	0.4657	0.0471	0.6026	0.4495	18.984
900	875	COMB48	0.4655	0.415	0.0493	0.4956	0.3848	31.437
900	873	COMB49	-0.1163	0.1948	0.0334	0.1983	-0.1199	83.941
900	122	COMB49	-0.0892	0.199	0.0356	0.2033	-0.0935	83.071
900	877	COMB49	-0.0653	0.2917	0.035	0.2951	-0.0687	84.452
900	875	COMB49	-0.0925	0.2876	0.0329	0.2904	-0.0953	85.095
900	873	COMB50	-5.2503	0.2038	-0.0262	0.204	-5.2504	-89.725

900	122	COMB50	-5.1091	0.2018	-0.0093	0.2018	-5.1091	-89.9
900	877	COMB50	-5.0379	0.3561	-0.0213	0.3562	-5.038	-89.774
900	875	COMB50	-5.1772	0.354	-0.0382	0.3542	-5.1774	-89.605
900	873	COMB51	0.905	0.7345	-0.2196	1.0553	0.5842	-34.39
900	122	COMB51	0.3433	0.5422	-0.2257	0.6894	0.1961	-56.89
900	877	COMB51	0.3534	0.6232	-0.2636	0.7845	0.1922	-58.551
900	875	COMB51	0.9	0.8295	-0.2575	1.1247	0.6048	-41.098
900	873	COMB52	7.1951	3.04	-0.1446	7.2002	3.0349	-1.99
900	122	COMB52	8.1757	3.418	-0.1152	8.1785	3.4152	-1.386
900	877	COMB52	8.3615	3.7875	-0.0409	8.3619	3.7872	-0.512
900	875	COMB52	7.3025	3.411	-0.0702	7.3038	3.4097	-1.033
900	873	COMB53	-0.2555	0.647	0.1764	0.6802	-0.2888	79.327
900	122	COMB53	0.2269	0.7945	0.1773	0.8453	0.1761	74.002
900	877	COMB53	0.2627	0.9965	0.2018	1.0483	0.2109	75.598
900	875	COMB53	-0.2077	0.8395	0.2008	0.8767	-0.2449	79.509
900	873	COMB54	-0.8329	0.1003	0.1186	0.1151	-0.8477	82.87
900	122	COMB54	-0.7554	0.11	0.1272	0.1283	-0.7737	81.811
900	877	COMB54	-0.7192	0.1832	0.1245	0.2001	-0.7361	82.285
900	875	COMB54	-0.7972	0.1741	0.116	0.1878	-0.8108	83.285
900	873	COMB55	-4.794	-0.0571	-0.0116	-0.0571	-4.794	-89.86
900	122	COMB55	-4.7575	-0.0696	0.0056	-0.0696	-4.7575	89.932
900	877	COMB55	-4.709	-0.0376	-0.0026	-0.0376	-4.709	-89.969
900	875	COMB55	-4.7453	-0.0267	-0.0197	-0.0266	-4.7453	-89.761
900	873	COMB56	0.3221	0.7068	-0.2334	0.8169	0.212	-64.751
900	122	COMB56	-0.2986	0.5082	-0.238	0.5732	-0.3636	-74.729
900	877	COMB56	-0.2862	0.5817	-0.2739	0.6609	-0.3654	-73.871
900	875	COMB56	0.3189	0.7954	-0.2692	0.9166	0.1976	-65.754
900	873	COMB57	6.9109	3.0401	-0.1669	6.9181	3.0329	-2.464
900	122	COMB57	7.849	3.415	-0.1376	7.8532	3.4107	-1.775
900	877	COMB57	8.0344	3.7825	-0.0611	8.0353	3.7817	-0.823
900	875	COMB57	7.0178	3.4097	-0.0904	7.0201	3.4075	-1.434
900	873	COMB58	0.9899	0.4695	0.1537	1.0319	0.4275	15.29
900	122	COMB58	1.3934	0.6138	0.1504	1.4214	0.5858	10.552
900	877	COMB58	1.3979	0.7095	0.1799	1.442	0.6653	13.797
900	875	COMB58	1.0057	0.5572	0.1832	1.071	0.4919	19.623
900	873	COMB59	-0.8145	0.1107	0.1082	0.1231	-0.8269	83.418
900	122	COMB59	-0.7429	0.1208	0.1162	0.1361	-0.7583	82.469
900	877	COMB59	-0.7079	0.1956	0.1143	0.2098	-0.7221	82.902
900	875	COMB59	-0.7798	0.186	0.1063	0.1976	-0.7914	83.796
900	873	COMB60	-1.0429	0.1288	0.0251	0.1293	-1.0434	88.775
900	122	COMB60	-1.1009	0.119	0.0301	0.1198	-1.1016	88.587
900	877	COMB60	-1.0717	0.1988	0.0305	0.1995	-1.0724	88.626
900	875	COMB60	-1.0149	0.2102	0.0254	0.2108	-1.0154	88.811

900	873	COMB61	-0.6785	0.1856	-0.0162	0.1859	-0.6789	-88.923
900	122	COMB61	-0.7526	0.1774	-0.0144	0.1776	-0.7528	-89.114
900	877	COMB61	-0.7297	0.2667	-0.0119	0.2669	-0.7298	-89.318
900	875	COMB61	-0.6563	0.2763	-0.0137	0.2765	-0.6565	-89.157
900	873	COMB62	-0.3231	0.2219	-0.0303	0.2236	-0.3248	-86.825
900	122	COMB62	-0.3828	0.2174	-0.0303	0.2189	-0.3843	-87.113
900	877	COMB62	-0.3634	0.3136	-0.0274	0.3147	-0.3645	-87.688
900	875	COMB62	-0.304	0.319	-0.0274	0.3202	-0.3052	-87.491
900	873	COMB63	-0.0411	0.2366	-0.0251	0.2388	-0.0433	-84.883
900	122	COMB63	-0.0717	0.2353	-0.0258	0.2375	-0.0739	-85.223
900	877	COMB63	-0.0536	0.3355	-0.0238	0.337	-0.055	-86.511
900	875	COMB63	-0.023	0.3371	-0.023	0.3386	-0.0244	-86.355
900	873	COMB64	0.0924	0.2369	-0.015	0.2385	0.0909	-84.123
900	122	COMB64	0.082	0.2372	-0.0158	0.2388	0.0804	-84.237
900	877	COMB64	0.1003	0.3385	-0.0148	0.3394	0.0994	-86.458
900	875	COMB64	0.1108	0.3382	-0.014	0.339	0.1099	-86.488
900	873	COMB65	0.1339	0.2319	-0.0061	0.2323	0.1335	-86.463
900	122	COMB65	0.1347	0.2327	-0.0066	0.2331	0.1342	-86.161
900	877	COMB65	0.1535	0.3336	-0.0063	0.3338	0.1533	-87.991
900	875	COMB65	0.1528	0.3327	-0.0058	0.3329	0.1526	-88.155
900	873	COMB66	0.1385	0.2262	0.0008189	0.2262	0.1385	89.465
900	122	COMB66	0.1457	0.227	0.0005952	0.227	0.1457	89.58
900	877	COMB66	0.1652	0.3272	0.0003501	0.3272	0.1652	89.876
900	875	COMB66	0.158	0.3262	0.0005738	0.3262	0.158	89.805
900	873	COMB67	-0.6565	0.175	-0.2536	0.2463	-0.7278	-74.307
900	122	COMB67	-0.63	0.1696	-0.2451	0.2387	-0.6991	-74.244
900	877	COMB67	-0.59	0.2645	-0.2497	0.3322	-0.6576	-74.847
900	875	COMB67	-0.6162	0.2703	-0.2583	0.34	-0.686	-74.885
900	873	COMB68	0.1055	0.3637	-0.2398	0.507	-0.0378	-59.145
900	122	COMB68	0.0132	0.3195	-0.2419	0.4527	-0.12	-61.171
900	877	COMB68	0.0323	0.4261	-0.2539	0.5505	-0.0922	-63.895
900	875	COMB68	0.1193	0.4738	-0.2518	0.6045	-0.0114	-62.569
900	873	COMB69	1.8755	1.1148	-0.036	1.8772	1.1131	-2.701
900	122	COMB69	1.6123	1.02	-0.0388	1.6148	1.0175	-3.728
900	877	COMB69	1.6335	1.2081	-0.056	1.6408	1.2009	-7.381
900	875	COMB69	1.9158	1.303	-0.0533	1.9204	1.2984	-4.931
900	873	COMB70	0.3019	0.3821	0.1398	0.4874	0.1966	53.002
900	122	COMB70	0.4131	0.4387	0.1329	0.5594	0.2924	47.754
900	877	COMB70	0.4156	0.5558	0.149	0.6504	0.321	57.599
900	875	COMB70	0.3112	0.4941	0.1559	0.5834	0.2219	60.201
900	873	COMB71	-0.1163	0.2092	0.1595	0.2743	-0.1814	67.788
900	122	COMB71	-0.0972	0.2197	0.1633	0.2887	-0.1663	67.068
900	877	COMB71	-0.0685	0.3191	0.1664	0.3807	-0.1301	69.68

900	875	COMB71	-0.0865	0.3079	0.1625	0.3662	-0.1448	70.248
900	873	COMB72	-2.7446	0.0425	-0.9381	0.3289	-3.031	-73.026
900	122	COMB72	-2.7	0.0095	-0.9022	0.2824	-2.9729	-73.17
900	877	COMB72	-2.5938	0.0921	-0.9207	0.3774	-2.8791	-72.783
900	875	COMB72	-2.6396	0.1273	-0.9566	0.4258	-2.9382	-72.668
900	873	COMB73	0.658	1.0042	-0.8319	1.6808	-0.0186	-50.878
900	122	COMB73	0.1816	0.7771	-0.8497	1.3798	-0.421	-54.655
900	877	COMB73	0.1814	0.9198	-0.9118	1.5343	-0.4332	-56.021
900	875	COMB73	0.6312	1.1675	-0.894	1.8327	-0.034	-53.348
900	873	COMB74	6.2881	3.4394	-0.1485	6.2958	3.4317	-2.977
900	122	COMB74	7.2921	3.8237	-0.1585	7.2993	3.8164	-2.612
900	877	COMB74	7.3974	4.2824	-0.0832	7.3996	4.2802	-1.529
900	875	COMB74	6.317	3.8984	-0.0732	6.3192	3.8962	-1.732
900	873	COMB75	0.5635	0.6795	0.644	1.2681	-0.025	47.573
900	122	COMB75	0.9328	0.862	0.6283	1.5267	0.268	43.388
900	877	COMB75	0.9115	1.0129	0.6791	1.6431	0.2812	47.134
900	875	COMB75	0.565	0.8157	0.6947	1.3963	-0.0155	50.114
900	873	COMB76	-0.785	0.1323	0.632	0.4546	-1.1072	62.984
900	122	COMB76	-0.7327	0.1643	0.6496	0.5052	-1.0736	62.31
900	877	COMB76	-0.6714	0.2613	0.6595	0.6027	-1.0128	62.633
900	875	COMB76	-0.7209	0.2269	0.6419	0.5508	-1.0449	63.218
900	873	COMB77	-3.4344	-0.0658	-0.6334	0.0493	-3.5496	-79.695
900	122	COMB77	-3.4254	-0.1015	-0.5844	-0.0018	-3.5252	-80.313
900	877	COMB77	-3.2879	-0.0271	-0.6011	0.0802	-3.3951	-79.881
900	875	COMB77	-3.2994	0.0109	-0.6501	0.134	-3.4225	-79.278
900	873	COMB78	0.2017	0.9322	-0.6605	1.3217	-0.1878	-59.472
900	122	COMB78	-0.316	0.6994	-0.6699	1.0322	-0.6489	-63.579
900	877	COMB78	-0.2958	0.8363	-0.7311	1.1948	-0.6544	-63.874
900	875	COMB78	0.194	1.0903	-0.7217	1.4916	-0.2074	-60.919
900	873	COMB79	6.0522	3.4028	-0.0608	6.0536	3.4015	-1.313
900	122	COMB79	7.0271	3.7831	-0.0662	7.0284	3.7817	-1.168
900	877	COMB79	7.1437	4.2393	0.0098	7.1438	4.2392	0.194
900	875	COMB79	6.0914	3.8597	0.0152	6.0915	3.8595	0.391
900	873	COMB80	0.4722	0.6629	0.6897	1.2638	-0.1287	48.937
900	122	COMB80	0.8263	0.8434	0.6764	1.5113	0.1584	45.36
900	877	COMB80	0.811	0.9936	0.7275	1.6355	0.1691	48.576
900	875	COMB80	0.4791	0.7987	0.7408	1.3967	-0.1189	51.087
900	873	COMB81	-0.8051	0.1249	0.6572	0.465	-1.1452	62.64
900	122	COMB81	-0.7585	0.156	0.6761	0.5149	-1.1175	62.036
900	877	COMB81	-0.6941	0.2531	0.686	0.6131	-1.0541	62.311
900	875	COMB81	-0.7382	0.2196	0.6672	0.562	-1.0805	62.835
900	873	COMB82	-0.8466	0.0744	0.4281	0.2426	-1.0148	68.545
900	122	COMB82	-0.8937	0.0711	0.4462	0.2459	-1.0684	68.616

900	877	COMB82	-0.8301	0.1597	0.4488	0.3329	-1.0033	68.9
900	875	COMB82	-0.7848	0.1632	0.4306	0.3295	-0.9512	68.874
900	873	COMB83	-0.5369	0.1216	0.2443	0.2023	-0.6177	71.714
900	122	COMB83	-0.5917	0.1137	0.2562	0.1969	-0.6749	72.003
900	877	COMB83	-0.5429	0.2051	0.2573	0.285	-0.6229	72.739
900	875	COMB83	-0.4902	0.2137	0.2454	0.2908	-0.5673	72.558
900	873	COMB84	-0.2537	0.1726	0.1197	0.2039	-0.285	75.339
900	122	COMB84	-0.295	0.167	0.1259	0.1991	-0.3271	75.699
900	877	COMB84	-0.2598	0.2625	0.1269	0.2917	-0.289	77.043
900	875	COMB84	-0.2198	0.2687	0.1207	0.2969	-0.248	76.855
900	873	COMB85	-0.0564	0.2001	0.062	0.2143	-0.0706	77.107
900	122	COMB85	-0.079	0.1971	0.0651	0.2117	-0.0936	77.366
900	877	COMB85	-0.051	0.2953	0.0657	0.3073	-0.0631	79.613
900	875	COMB85	-0.0292	0.2986	0.0625	0.3101	-0.0407	79.562
900	873	COMB86	0.0421	0.2127	0.0337	0.2191	0.0357	79.233
900	122	COMB86	0.0323	0.2113	0.0353	0.2181	0.0256	79.241
900	877	COMB86	0.0564	0.3107	0.0355	0.3155	0.0515	82.199
900	875	COMB86	0.0658	0.3121	0.0339	0.3167	0.0612	82.312
900	873	COMB87	0.0795	0.2172	0.0208	0.2202	0.0765	81.608
900	122	COMB87	0.0768	0.2165	0.0217	0.2198	0.0735	81.379
900	877	COMB87	0.0991	0.316	0.0216	0.3182	0.097	84.36
900	875	COMB87	0.1016	0.3167	0.0207	0.3186	0.0996	84.549
900	873	COMB88	0.0905	0.218	0.0152	0.2198	0.0887	83.306
900	122	COMB88	0.0919	0.2177	0.0158	0.2197	0.0899	82.952
900	877	COMB88	0.1133	0.3171	0.0156	0.3183	0.1122	85.656
900	875	COMB88	0.1119	0.3173	0.0149	0.3184	0.1108	85.864
900	873	COMB89	-0.9896	0.1738	0.0028	0.1738	-0.9896	89.864
900	122	COMB89	-0.9464	0.1756	0.0056	0.1757	-0.9464	89.716
900	877	COMB89	-0.9224	0.2631	0.0029	0.2631	-0.9224	89.861
900	875	COMB89	-0.965	0.2603	0.000078	0.2603	-0.965	89.996
900	873	COMB90	0.1362	0.3028	-0.0565	0.3201	0.1189	-72.925
900	122	COMB90	0.026	0.2676	-0.0566	0.2802	0.0135	-77.454
900	877	COMB90	0.046	0.3605	-0.0627	0.3726	0.0339	-79.132
900	875	COMB90	0.1534	0.3976	-0.0626	0.4127	0.1383	-76.42
900	873	COMB91	2.1011	1.0123	-0.0005857	2.1011	1.0123	-0.031
900	122	COMB91	1.8292	0.9179	0.0067	1.8292	0.9179	0.419
900	877	COMB91	1.8707	1.0842	-0.0096	1.8708	1.084	-0.7
900	875	COMB91	2.1619	1.1784	-0.0169	2.1622	1.1781	-0.982
900	873	COMB92	0.4491	0.3168	0.0388	0.4596	0.3063	15.198
900	122	COMB92	0.5738	0.3642	0.0366	0.58	0.3579	9.622
900	877	COMB92	0.5864	0.4657	0.0471	0.6026	0.4495	18.984
900	875	COMB92	0.4655	0.415	0.0493	0.4956	0.3848	31.437
900	873	COMB93	-0.1163	0.1948	0.0334	0.1983	-0.1199	83.941

900	122	COMB93	-0.0892	0.199	0.0356	0.2033	-0.0935	83.071
900	877	COMB93	-0.0653	0.2917	0.035	0.2951	-0.0687	84.452
900	875	COMB93	-0.0925	0.2876	0.0329	0.2904	-0.0953	85.095
900	873	COMB94	-5.2503	0.2038	-0.0262	0.204	-5.2504	-89.725
900	122	COMB94	-5.1091	0.2018	-0.0093	0.2018	-5.1091	-89.9
900	877	COMB94	-5.0379	0.3561	-0.0213	0.3562	-5.038	-89.774
900	875	COMB94	-5.1772	0.354	-0.0382	0.3542	-5.1774	-89.605
900	873	COMB95	0.905	0.7345	-0.2196	1.0553	0.5842	-34.39
900	122	COMB95	0.3433	0.5422	-0.2257	0.6894	0.1961	-56.89
900	877	COMB95	0.3534	0.6232	-0.2636	0.7845	0.1922	-58.551
900	875	COMB95	0.9	0.8295	-0.2575	1.1247	0.6048	-41.098
900	873	COMB96	7.1951	3.04	-0.1446	7.2002	3.0349	-1.99
900	122	COMB96	8.1757	3.418	-0.1152	8.1785	3.4152	-1.386
900	877	COMB96	8.3615	3.7875	-0.0409	8.3619	3.7872	-0.512
900	875	COMB96	7.3025	3.411	-0.0702	7.3038	3.4097	-1.033
900	873	COMB97	-0.2555	0.647	0.1764	0.6802	-0.2888	79.327
900	122	COMB97	0.2269	0.7945	0.1773	0.8453	0.1761	74.002
900	877	COMB97	0.2627	0.9965	0.2018	1.0483	0.2109	75.598
900	875	COMB97	-0.2077	0.8395	0.2008	0.8767	-0.2449	79.509
900	873	COMB98	-0.8329	0.1003	0.1186	0.1151	-0.8477	82.87
900	122	COMB98	-0.7554	0.11	0.1272	0.1283	-0.7737	81.811
900	877	COMB98	-0.7192	0.1832	0.1245	0.2001	-0.7361	82.285
900	875	COMB98	-0.7972	0.1741	0.116	0.1878	-0.8108	83.285
900	873	COMB99	-4.794	-0.0571	-0.0116	-0.0571	-4.794	-89.86
900	122	COMB99	-4.7575	-0.0696	0.0056	-0.0696	-4.7575	89.932
900	877	COMB99	-4.709	-0.0376	-0.0026	-0.0376	-4.709	-89.969
900	875	COMB99	-4.7453	-0.0267	-0.0197	-0.0266	-4.7453	-89.761
900	873	COMB100	0.3221	0.7068	-0.2334	0.8169	0.212	-64.751
900	122	COMB100	-0.2986	0.5082	-0.238	0.5732	-0.3636	-74.729
900	877	COMB100	-0.2862	0.5817	-0.2739	0.6609	-0.3654	-73.871
900	875	COMB100	0.3189	0.7954	-0.2692	0.9166	0.1976	-65.754
900	873	COMB101	6.9109	3.0401	-0.1669	6.9181	3.0329	-2.464
900	122	COMB101	7.849	3.415	-0.1376	7.8532	3.4107	-1.775
900	877	COMB101	8.0344	3.7825	-0.0611	8.0353	3.7817	-0.823
900	875	COMB101	7.0178	3.4097	-0.0904	7.0201	3.4075	-1.434
900	873	COMB102	0.9899	0.4695	0.1537	1.0319	0.4275	15.29
900	122	COMB102	1.3934	0.6138	0.1504	1.4214	0.5858	10.552
900	877	COMB102	1.3979	0.7095	0.1799	1.442	0.6653	13.797
900	875	COMB102	1.0057	0.5572	0.1832	1.071	0.4919	19.623
900	873	COMB103	-0.8145	0.1107	0.1082	0.1231	-0.8269	83.418
900	122	COMB103	-0.7429	0.1208	0.1162	0.1361	-0.7583	82.469
900	877	COMB103	-0.7079	0.1956	0.1143	0.2098	-0.7221	82.902
900	875	COMB103	-0.7798	0.186	0.1063	0.1976	-0.7914	83.796

900	873	COMB104	-1.0429	0.1288	0.0251	0.1293	-1.0434	88.775
900	122	COMB104	-1.1009	0.119	0.0301	0.1198	-1.1016	88.587
900	877	COMB104	-1.0717	0.1988	0.0305	0.1995	-1.0724	88.626
900	875	COMB104	-1.0149	0.2102	0.0254	0.2108	-1.0154	88.811
900	873	COMB105	-0.6785	0.1856	-0.0162	0.1859	-0.6789	-88.923
900	122	COMB105	-0.7526	0.1774	-0.0144	0.1776	-0.7528	-89.114
900	877	COMB105	-0.7297	0.2667	-0.0119	0.2669	-0.7298	-89.318
900	875	COMB105	-0.6563	0.2763	-0.0137	0.2765	-0.6565	-89.157
900	873	COMB106	-0.3231	0.2219	-0.0303	0.2236	-0.3248	-86.825
900	122	COMB106	-0.3828	0.2174	-0.0303	0.2189	-0.3843	-87.113
900	877	COMB106	-0.3634	0.3136	-0.0274	0.3147	-0.3645	-87.688
900	875	COMB106	-0.304	0.319	-0.0274	0.3202	-0.3052	-87.491
900	873	COMB107	-0.0411	0.2366	-0.0251	0.2388	-0.0433	-84.883
900	122	COMB107	-0.0717	0.2353	-0.0258	0.2375	-0.0739	-85.223
900	877	COMB107	-0.0536	0.3355	-0.0238	0.337	-0.055	-86.511
900	875	COMB107	-0.023	0.3371	-0.023	0.3386	-0.0244	-86.355
900	873	COMB108	0.0924	0.2369	-0.015	0.2385	0.0909	-84.123
900	122	COMB108	0.082	0.2372	-0.0158	0.2388	0.0804	-84.237
900	877	COMB108	0.1003	0.3385	-0.0148	0.3394	0.0994	-86.458
900	875	COMB108	0.1108	0.3382	-0.014	0.339	0.1099	-86.488
900	873	COMB109	0.1339	0.2319	-0.0061	0.2323	0.1335	-86.463
900	122	COMB109	0.1347	0.2327	-0.0066	0.2331	0.1342	-86.161
900	877	COMB109	0.1535	0.3336	-0.0063	0.3338	0.1533	-87.991
900	875	COMB109	0.1528	0.3327	-0.0058	0.3329	0.1526	-88.155
900	873	COMB110	0.1385	0.2262	0.0008189	0.2262	0.1385	89.465
900	122	COMB110	0.1457	0.227	0.0005952	0.227	0.1457	89.58
900	877	COMB110	0.1652	0.3272	0.0003501	0.3272	0.1652	89.876
900	875	COMB110	0.158	0.3262	0.0005738	0.3262	0.158	89.805
900	873	COMB111	-0.6565	0.175	-0.2536	0.2463	-0.7278	-74.307
900	122	COMB111	-0.63	0.1696	-0.2451	0.2387	-0.6991	-74.244
900	877	COMB111	-0.59	0.2645	-0.2497	0.3322	-0.6576	-74.847
900	875	COMB111	-0.6162	0.2703	-0.2583	0.34	-0.686	-74.885
900	873	COMB112	0.1055	0.3637	-0.2398	0.507	-0.0378	-59.145
900	122	COMB112	0.0132	0.3195	-0.2419	0.4527	-0.12	-61.171
900	877	COMB112	0.0323	0.4261	-0.2539	0.5505	-0.0922	-63.895
900	875	COMB112	0.1193	0.4738	-0.2518	0.6045	-0.0114	-62.569
900	873	COMB113	1.8755	1.1148	-0.036	1.8772	1.1131	-2.701
900	122	COMB113	1.6123	1.02	-0.0388	1.6148	1.0175	-3.728
900	877	COMB113	1.6335	1.2081	-0.056	1.6408	1.2009	-7.381
900	875	COMB113	1.9158	1.303	-0.0533	1.9204	1.2984	-4.931
900	873	COMB114	0.3019	0.3821	0.1398	0.4874	0.1966	53.002
900	122	COMB114	0.4131	0.4387	0.1329	0.5594	0.2924	47.754
900	877	COMB114	0.4156	0.5558	0.149	0.6504	0.321	57.599

900	875	COMB114	0.3112	0.4941	0.1559	0.5834	0.2219	60.201
900	873	COMB115	-0.1163	0.2092	0.1595	0.2743	-0.1814	67.788
900	122	COMB115	-0.0972	0.2197	0.1633	0.2887	-0.1663	67.068
900	877	COMB115	-0.0685	0.3191	0.1664	0.3807	-0.1301	69.68
900	875	COMB115	-0.0865	0.3079	0.1625	0.3662	-0.1448	70.248
900	873	COMB116	-2.7446	0.0425	-0.9381	0.3289	-3.031	-73.026
900	122	COMB116	-2.7	0.0095	-0.9022	0.2824	-2.9729	-73.17
900	877	COMB116	-2.5938	0.0921	-0.9207	0.3774	-2.8791	-72.783
900	875	COMB116	-2.6396	0.1273	-0.9566	0.4258	-2.9382	-72.668
900	873	COMB117	0.658	1.0042	-0.8319	1.6808	-0.0186	-50.878
900	122	COMB117	0.1816	0.7771	-0.8497	1.3798	-0.421	-54.655
900	877	COMB117	0.1814	0.9198	-0.9118	1.5343	-0.4332	-56.021
900	875	COMB117	0.6312	1.1675	-0.894	1.8327	-0.034	-53.348
900	873	COMB118	6.2881	3.4394	-0.1485	6.2958	3.4317	-2.977
900	122	COMB118	7.2921	3.8237	-0.1585	7.2993	3.8164	-2.612
900	877	COMB118	7.3974	4.2824	-0.0832	7.3996	4.2802	-1.529
900	875	COMB118	6.317	3.8984	-0.0732	6.3192	3.8962	-1.732
900	873	COMB119	0.5635	0.6795	0.644	1.2681	-0.025	47.573
900	122	COMB119	0.9328	0.862	0.6283	1.5267	0.268	43.388
900	877	COMB119	0.9115	1.0129	0.6791	1.6431	0.2812	47.134
900	875	COMB119	0.565	0.8157	0.6947	1.3963	-0.0155	50.114
900	873	COMB120	-0.785	0.1323	0.632	0.4546	-1.1072	62.984
900	122	COMB120	-0.7327	0.1643	0.6496	0.5052	-1.0736	62.31
900	877	COMB120	-0.6714	0.2613	0.6595	0.6027	-1.0128	62.633
900	875	COMB120	-0.7209	0.2269	0.6419	0.5508	-1.0449	63.218
900	873	COMB121	-3.4344	-0.0658	-0.6334	0.0493	-3.5496	-79.695
900	122	COMB121	-3.4254	-0.1015	-0.5844	-0.0018	-3.5252	-80.313
900	877	COMB121	-3.2879	-0.0271	-0.6011	0.0802	-3.3951	-79.881
900	875	COMB121	-3.2994	0.0109	-0.6501	0.134	-3.4225	-79.278
900	873	COMB122	0.2017	0.9322	-0.6605	1.3217	-0.1878	-59.472
900	122	COMB122	-0.316	0.6994	-0.6699	1.0322	-0.6489	-63.579
900	877	COMB122	-0.2958	0.8363	-0.7311	1.1948	-0.6544	-63.874
900	875	COMB122	0.194	1.0903	-0.7217	1.4916	-0.2074	-60.919
900	873	COMB123	6.0522	3.4028	-0.0608	6.0536	3.4015	-1.313
900	122	COMB123	7.0271	3.7831	-0.0662	7.0284	3.7817	-1.168
900	877	COMB123	7.1437	4.2393	0.0098	7.1438	4.2392	0.194
900	875	COMB123	6.0914	3.8597	0.0152	6.0915	3.8595	0.391
900	873	COMB124	0.4722	0.6629	0.6897	1.2638	-0.1287	48.937
900	122	COMB124	0.8263	0.8434	0.6764	1.5113	0.1584	45.36
900	877	COMB124	0.811	0.9936	0.7275	1.6355	0.1691	48.576
900	875	COMB124	0.4791	0.7987	0.7408	1.3967	-0.1189	51.087
900	873	COMB125	-0.8051	0.1249	0.6572	0.465	-1.1452	62.64
900	122	COMB125	-0.7585	0.156	0.6761	0.5149	-1.1175	62.036

900	877	COMB125	-0.6941	0.2531	0.686	0.6131	-1.0541	62.311
900	875	COMB125	-0.7382	0.2196	0.6672	0.562	-1.0805	62.835
900	873	COMB126	-0.8466	0.0744	0.4281	0.2426	-1.0148	68.545
900	122	COMB126	-0.8937	0.0711	0.4462	0.2459	-1.0684	68.616
900	877	COMB126	-0.8301	0.1597	0.4488	0.3329	-1.0033	68.9
900	875	COMB126	-0.7848	0.1632	0.4306	0.3295	-0.9512	68.874
900	873	COMB127	-0.5369	0.1216	0.2443	0.2023	-0.6177	71.714
900	122	COMB127	-0.5917	0.1137	0.2562	0.1969	-0.6749	72.003
900	877	COMB127	-0.5429	0.2051	0.2573	0.285	-0.6229	72.739
900	875	COMB127	-0.4902	0.2137	0.2454	0.2908	-0.5673	72.558
900	873	COMB128	-0.2537	0.1726	0.1197	0.2039	-0.285	75.339
900	122	COMB128	-0.295	0.167	0.1259	0.1991	-0.3271	75.699
900	877	COMB128	-0.2598	0.2625	0.1269	0.2917	-0.289	77.043
900	875	COMB128	-0.2198	0.2687	0.1207	0.2969	-0.248	76.855
900	873	COMB129	-0.0564	0.2001	0.062	0.2143	-0.0706	77.107
900	122	COMB129	-0.079	0.1971	0.0651	0.2117	-0.0936	77.366
900	877	COMB129	-0.051	0.2953	0.0657	0.3073	-0.0631	79.613
900	875	COMB129	-0.0292	0.2986	0.0625	0.3101	-0.0407	79.562
900	873	COMB130	0.0421	0.2127	0.0337	0.2191	0.0357	79.233
900	122	COMB130	0.0323	0.2113	0.0353	0.2181	0.0256	79.241
900	877	COMB130	0.0564	0.3107	0.0355	0.3155	0.0515	82.199
900	875	COMB130	0.0658	0.3121	0.0339	0.3167	0.0612	82.312
900	873	COMB131	0.0795	0.2172	0.0208	0.2202	0.0765	81.608
900	122	COMB131	0.0768	0.2165	0.0217	0.2198	0.0735	81.379
900	877	COMB131	0.0991	0.316	0.0216	0.3182	0.097	84.36
900	875	COMB131	0.1016	0.3167	0.0207	0.3186	0.0996	84.549
900	873	COMB132	0.0905	0.218	0.0152	0.2198	0.0887	83.306
900	122	COMB132	0.0919	0.2177	0.0158	0.2197	0.0899	82.952
900	877	COMB132	0.1133	0.3171	0.0156	0.3183	0.1122	85.656
900	875	COMB132	0.1119	0.3173	0.0149	0.3184	0.1108	85.864
975	898	COMB1	-0.9224	0.2631	-0.0055	0.2631	-0.9224	-89.732
975	933	COMB1	-0.8739	0.2672	-0.008	0.2672	-0.8739	-89.596
975	934	COMB1	-0.8973	0.1787	-0.0107	0.1788	-0.8975	-89.43
975	130	COMB1	-0.9464	0.1756	-0.0082	0.1757	-0.9465	-89.581
975	898	COMB2	0.0459	0.3605	0.0609	0.3719	0.0345	79.414
975	933	COMB2	-0.0448	0.3332	0.06	0.3425	-0.0541	81.198
975	934	COMB2	-0.0666	0.2414	0.0564	0.2514	-0.0766	79.95
975	130	COMB2	0.026	0.2676	0.0573	0.2805	0.0131	77.311
975	898	COMB3	1.8722	1.0845	0.017	1.8725	1.0841	1.233
975	933	COMB3	1.4033	0.9015	0.0194	1.404	0.9008	2.215
975	934	COMB3	1.3924	0.7478	-0.0174	1.3929	0.7473	-1.549
975	130	COMB3	1.8313	0.9183	-0.0199	1.8317	0.9179	-1.249
975	898	COMB4	0.5865	0.4657	-0.0464	0.6023	0.45	-18.774

975	933	COMB4	0.7302	0.5338	-0.0422	0.7389	0.5251	-11.621
975	934	COMB4	0.7221	0.4265	-0.0267	0.7245	0.4241	-5.126
975	130	COMB4	0.5739	0.3642	-0.031	0.5783	0.3597	-8.23
975	898	COMB5	-0.0653	0.2917	-0.0373	0.2955	-0.0692	-84.101
975	933	COMB5	-0.0275	0.2986	-0.0394	0.3033	-0.0322	-83.206
975	934	COMB5	-0.0512	0.2058	-0.0397	0.2118	-0.0572	-81.415
975	130	COMB5	-0.0892	0.199	-0.0376	0.2038	-0.094	-82.691
975	898	COMB6	-5.0379	0.3561	0.0048	0.3561	-5.0379	89.949
975	933	COMB6	-4.8563	0.3673	-0.0109	0.3673	-4.8563	-89.881
975	934	COMB6	-4.9253	0.2087	-0.0227	0.2088	-4.9254	-89.747
975	130	COMB6	-5.1092	0.2018	-0.007	0.2018	-5.1092	-89.925
975	898	COMB7	0.353	0.6231	0.2591	0.7803	0.1958	58.767
975	933	COMB7	-0.1159	0.469	0.259	0.5672	-0.2141	69.233
975	934	COMB7	-0.1372	0.3964	0.2354	0.4854	-0.2262	69.287
975	130	COMB7	0.343	0.5421	0.2355	0.6982	0.1869	56.46
975	898	COMB8	8.3615	3.7875	0.0707	8.3626	3.7864	0.886
975	933	COMB8	7.1703	3.4048	0.0413	7.1707	3.4044	0.628
975	934	COMB8	7.0626	3.0349	-0.0241	7.0628	3.0348	-0.343
975	130	COMB8	8.1757	3.418	0.0053	8.1757	3.418	0.064
975	898	COMB9	0.2631	0.9966	-0.207	1.051	0.2087	-75.277
975	933	COMB9	0.8187	1.208	-0.2014	1.2934	0.7333	-67.013
975	934	COMB9	0.7988	0.9907	-0.1623	1.0833	0.7062	-60.301
975	130	COMB9	0.2272	0.7945	-0.168	0.8405	0.1812	-74.683
975	898	COMB10	-0.7192	0.1833	-0.1334	0.2026	-0.7385	-81.765
975	933	COMB10	-0.6026	0.2011	-0.1421	0.2255	-0.627	-80.263
975	934	COMB10	-0.6387	0.1281	-0.1444	0.1543	-0.665	-79.681
975	130	COMB10	-0.7553	0.11	-0.1357	0.1308	-0.7761	-81.294
975	898	COMB11	-4.7091	-0.0377	-0.0143	-0.0376	-4.7091	-89.825
975	933	COMB11	-4.6288	-0.0404	-0.0311	-0.0402	-4.629	-89.612
975	934	COMB11	-4.6766	-0.0741	-0.0396	-0.0738	-4.677	-89.508
975	130	COMB11	-4.7575	-0.0696	-0.0227	-0.0695	-4.7576	-89.722
975	898	COMB12	-0.2866	0.5816	0.2679	0.6576	-0.3626	74.16
975	933	COMB12	-0.8138	0.4196	0.2661	0.4745	-0.8688	78.332
975	934	COMB12	-0.8381	0.3557	0.2444	0.4038	-0.8862	78.868
975	130	COMB12	-0.299	0.5081	0.2462	0.5773	-0.3681	74.307
975	898	COMB13	8.0344	3.7825	0.0909	8.0364	3.7806	1.224
975	933	COMB13	6.7977	3.3956	0.0613	6.7988	3.3945	1.032
975	934	COMB13	6.6901	3.0284	-0.0019	6.6901	3.0284	-0.029
975	130	COMB13	7.849	3.415	0.0277	7.8491	3.4148	0.358
975	898	COMB14	1.3983	0.7096	-0.1812	1.4431	0.6648	-13.876
975	933	COMB14	1.865	0.9142	-0.1717	1.895	0.8841	-9.93
975	934	COMB14	1.8755	0.8049	-0.1275	1.8905	0.79	-6.7
975	130	COMB14	1.3937	0.6138	-0.137	1.417	0.5905	-9.68

975	898	COMB15	-0.7078	0.1956	-0.1226	0.212	-0.7242	-82.407
975	933	COMB15	-0.5991	0.2138	-0.1307	0.2343	-0.6196	-81.084
975	934	COMB15	-0.634	0.1391	-0.1322	0.1611	-0.656	-80.558
975	130	COMB15	-0.7429	0.1208	-0.1241	0.1383	-0.7604	-81.983
975	898	COMB16	-1.0717	0.1988	-0.0355	0.1998	-1.0727	-88.4
975	933	COMB16	-1.1156	0.1885	-0.0411	0.1898	-1.1169	-88.195
975	934	COMB16	-1.1459	0.1103	-0.0414	0.1116	-1.1472	-88.114
975	130	COMB16	-1.1009	0.119	-0.0358	0.1201	-1.1019	-88.322
975	898	COMB17	-0.7297	0.2667	0.0099	0.2668	-0.7298	89.43
975	933	COMB17	-0.8022	0.2568	0.0076	0.2569	-0.8023	89.586
975	934	COMB17	-0.8259	0.1689	0.01	0.169	-0.826	89.427
975	130	COMB17	-0.7526	0.1774	0.0122	0.1776	-0.7528	89.247
975	898	COMB18	-0.3634	0.3136	0.0272	0.3147	-0.3644	87.7
975	933	COMB18	-0.4269	0.3075	0.027	0.3085	-0.4279	87.895
975	934	COMB18	-0.4468	0.2123	0.0301	0.2136	-0.4481	87.39
975	130	COMB18	-0.3828	0.2174	0.0303	0.2189	-0.3843	87.116
975	898	COMB19	-0.0536	0.3355	0.0245	0.3371	-0.0551	86.415
975	933	COMB19	-0.0883	0.3336	0.0252	0.3351	-0.0898	86.594
975	934	COMB19	-0.1065	0.2338	0.0274	0.2359	-0.1087	85.425
975	130	COMB19	-0.0717	0.2353	0.0267	0.2376	-0.0741	85.07
975	898	COMB20	0.1003	0.3385	0.0155	0.3395	0.0993	86.285
975	933	COMB20	0.0873	0.3386	0.0163	0.3397	0.0863	86.295
975	934	COMB20	0.0691	0.2374	0.0175	0.2392	0.0673	84.122
975	130	COMB20	0.082	0.2372	0.0167	0.239	0.0803	83.926
975	898	COMB21	0.1535	0.3336	0.0068	0.3338	0.1533	87.832
975	933	COMB21	0.1533	0.3344	0.0074	0.3347	0.153	87.667
975	934	COMB21	0.1345	0.2334	0.0078	0.234	0.1339	85.541
975	130	COMB21	0.1347	0.2327	0.0072	0.2332	0.1342	85.824
975	898	COMB22	0.1652	0.3272	-0.000112	0.3272	0.1652	-89.96
975	933	COMB22	0.1728	0.3283	0.0001599	0.3283	0.1728	89.941
975	934	COMB22	0.1534	0.2279	-0.00006766	0.2279	0.1534	-89.948
975	130	COMB22	0.1457	0.227	-0.0003396	0.227	0.1457	-89.761
975	898	COMB23	-0.2424	0.3206	-0.2457	0.4127	-0.3346	-69.441
975	933	COMB23	-0.2259	0.3277	-0.2398	0.4171	-0.3153	-69.549
975	934	COMB23	-0.2297	0.2348	-0.2384	0.3354	-0.3303	-67.126
975	130	COMB23	-0.2462	0.2289	-0.2443	0.3321	-0.3495	-67.098
975	898	COMB24	0.1036	0.2564	-0.1918	0.3865	-0.0265	-55.858
975	933	COMB24	0.0821	0.2665	-0.1927	0.388	-0.0393	-57.789
975	934	COMB24	0.0638	0.1795	-0.1869	0.3174	-0.074	-53.594
975	130	COMB24	0.0831	0.1709	-0.1861	0.3182	-0.0642	-51.641
975	898	COMB25	0.327	0.198	-0.0563	0.3481	0.1769	-20.552
975	933	COMB25	0.3112	0.2009	-0.066	0.342	0.17	-25.054
975	934	COMB25	0.2723	0.123	-0.0636	0.2957	0.0996	-20.214

975	130	COMB25	0.287	0.1208	-0.0539	0.303	0.1048	-16.472
975	898	COMB26	0.2608	0.2319	0.0972	0.3446	0.1481	40.773
975	933	COMB26	0.2746	0.2213	0.0912	0.3429	0.1529	36.856
975	934	COMB26	0.2416	0.1393	0.0859	0.2905	0.0905	29.614
975	130	COMB26	0.2309	0.1483	0.0919	0.2904	0.0888	32.901
975	898	COMB27	0.0931	0.2945	0.1337	0.3612	0.0264	63.492
975	933	COMB27	0.103	0.2865	0.1349	0.3578	0.0316	62.114
975	934	COMB27	0.0867	0.1951	0.1308	0.2825	-0.0007457	56.253
975	130	COMB27	0.0782	0.2022	0.1297	0.2839	-0.0036	57.773
975	898	COMB28	-1.1192	0.2883	-0.869	0.7028	-1.5337	-64.501
975	933	COMB28	-1.0749	0.3162	-0.8451	0.7152	-1.4739	-64.728
975	934	COMB28	-1.0283	0.2482	-0.838	0.6633	-1.4434	-63.648
975	130	COMB28	-1.074	0.2247	-0.8619	0.6545	-1.5037	-63.497
975	898	COMB29	0.2619	0.0254	-0.6567	0.8109	-0.5236	-39.896
975	933	COMB29	0.1632	0.0664	-0.6634	0.7799	-0.5503	-42.912
975	934	COMB29	0.1439	0.0226	-0.6391	0.7253	-0.5588	-42.288
975	130	COMB29	0.2318	-0.0121	-0.6324	0.7539	-0.5342	-39.543
975	898	COMB30	1.054	-0.1729	-0.084	1.0598	-0.1787	-3.9
975	933	COMB30	1.0095	-0.1705	-0.1235	1.0223	-0.1833	-5.909
975	934	COMB30	0.9108	-0.181	-0.1188	0.9236	-0.1938	-6.137
975	130	COMB30	0.9539	-0.1829	-0.0794	0.9594	-0.1884	-3.974
975	898	COMB31	0.676	0.008	0.4671	0.9163	-0.2323	27.217
975	933	COMB31	0.7403	-0.0357	0.449	0.9457	-0.2411	24.585
975	934	COMB31	0.6815	-0.0721	0.4267	0.874	-0.2646	24.276
975	130	COMB31	0.6293	-0.0351	0.4448	0.8523	-0.2581	26.624
975	898	COMB32	0.0422	0.2439	0.5449	0.6972	-0.4111	50.245
975	933	COMB32	0.0789	0.2156	0.5521	0.7036	-0.4091	48.528
975	934	COMB32	0.0799	0.1437	0.5378	0.6505	-0.4269	46.696
975	130	COMB32	0.0475	0.1686	0.5305	0.642	-0.4259	48.254
975	898	COMB33	-1.3312	0.3115	-0.5633	0.4861	-1.5058	-72.778
975	933	COMB33	-1.2945	0.332	-0.5302	0.4896	-1.452	-73.449
975	934	COMB33	-1.2235	0.2722	-0.5253	0.4382	-1.3895	-72.458
975	130	COMB33	-1.2618	0.2548	-0.5584	0.4382	-1.4453	-71.816
975	898	COMB34	0.0994	0.0674	-0.4584	0.5421	-0.3752	-43.999
975	933	COMB34	-0.0173	0.1068	-0.4577	0.5067	-0.4171	-48.861
975	934	COMB34	-0.0176	0.0654	-0.4325	0.4584	-0.4106	-47.74
975	130	COMB34	0.0875	0.0316	-0.4331	0.4936	-0.3745	-43.156
975	898	COMB35	0.9806	-0.1347	0.0339	0.9817	-0.1358	1.739
975	933	COMB35	0.9208	-0.1318	-0.0006412	0.9208	-0.1318	-0.035
975	934	COMB35	0.8344	-0.1426	0.0056	0.8345	-0.1427	0.328
975	130	COMB35	0.8921	-0.1453	0.0401	0.8936	-0.1468	2.212
975	898	COMB36	0.6768	0.0378	0.5357	0.9811	-0.2664	29.593
975	933	COMB36	0.7336	-0.0046	0.5207	1.0028	-0.2737	27.333

975	934	COMB36	0.6826	-0.0424	0.4995	0.9373	-0.2971	27.017
975	130	COMB36	0.6373	-0.0068	0.5145	0.9222	-0.2917	28.981
975	898	COMB37	0.0762	0.2644	0.5835	0.7613	-0.4207	49.582
975	933	COMB37	0.1116	0.2375	0.5927	0.7705	-0.4214	48.031
975	934	COMB37	0.1173	0.1641	0.579	0.7201	-0.4387	46.157
975	130	COMB37	0.0858	0.1877	0.5698	0.7088	-0.4353	47.554
975	898	COMB38	-0.1517	0.3611	0.4327	0.6077	-0.3983	60.323
975	933	COMB38	-0.1598	0.3516	0.446	0.61	-0.4182	59.912
975	934	COMB38	-0.1446	0.2628	0.4429	0.5466	-0.4285	57.348
975	130	COMB38	-0.137	0.2707	0.4297	0.5424	-0.4087	57.691
975	898	COMB39	-0.0968	0.3836	0.2803	0.5126	-0.2257	65.299
975	933	COMB39	-0.1183	0.3821	0.2909	0.5155	-0.2517	65.349
975	934	COMB39	-0.1109	0.2857	0.2921	0.4405	-0.2656	62.084
975	130	COMB39	-0.0907	0.2865	0.2816	0.4368	-0.241	61.91
975	898	COMB40	-0.0136	0.3731	0.1614	0.4316	-0.0722	70.071
975	933	COMB40	-0.0363	0.3734	0.1681	0.4335	-0.0964	70.316
975	934	COMB40	-0.0393	0.274	0.1702	0.3486	-0.114	66.312
975	130	COMB40	-0.0176	0.2732	0.1636	0.3466	-0.0911	65.82
975	898	COMB41	0.0874	0.3622	0.0943	0.3915	0.0582	72.77
975	933	COMB41	0.0752	0.3637	0.0986	0.3942	0.0448	72.825
975	934	COMB41	0.0659	0.2627	0.1002	0.3048	0.0238	67.232
975	130	COMB41	0.0774	0.2611	0.096	0.3021	0.0364	66.873
975	898	COMB42	0.1339	0.3498	0.0535	0.3623	0.1213	76.817
975	933	COMB42	0.13	0.3514	0.0562	0.3648	0.1165	76.551
975	934	COMB42	0.1165	0.2503	0.0572	0.2714	0.0954	69.742
975	130	COMB42	0.1199	0.2487	0.0545	0.2687	0.0999	69.876
975	898	COMB43	0.1443	0.3395	0.0302	0.3441	0.1398	81.405
975	933	COMB43	0.1454	0.3409	0.0318	0.3459	0.1404	80.988
975	934	COMB43	0.1294	0.2402	0.0323	0.2489	0.1207	74.891
975	130	COMB43	0.128	0.2389	0.0307	0.2469	0.1201	75.533
975	898	COMB44	0.1417	0.3321	0.0169	0.3336	0.1403	84.978
975	933	COMB44	0.146	0.3332	0.0178	0.3349	0.1443	84.606
975	934	COMB44	0.1285	0.2331	0.0179	0.2361	0.1255	80.537
975	130	COMB44	0.124	0.2321	0.0169	0.2347	0.1214	81.29
975	898	COMB45	-0.9224	0.2631	-0.0055	0.2631	-0.9224	-89.732
975	933	COMB45	-0.8739	0.2672	-0.008	0.2672	-0.8739	-89.596
975	934	COMB45	-0.8973	0.1787	-0.0107	0.1788	-0.8975	-89.43
975	130	COMB45	-0.9464	0.1756	-0.0082	0.1757	-0.9465	-89.581
975	898	COMB46	0.0459	0.3605	0.0609	0.3719	0.0345	79.414
975	933	COMB46	-0.0448	0.3332	0.06	0.3425	-0.0541	81.198
975	934	COMB46	-0.0666	0.2414	0.0564	0.2514	-0.0766	79.95
975	130	COMB46	0.026	0.2676	0.0573	0.2805	0.0131	77.311
975	898	COMB47	1.8722	1.0845	0.017	1.8725	1.0841	1.233

975	933	COMB47	1.4033	0.9015	0.0194	1.404	0.9008	2.215
975	934	COMB47	1.3924	0.7478	-0.0174	1.3929	0.7473	-1.549
975	130	COMB47	1.8313	0.9183	-0.0199	1.8317	0.9179	-1.249
975	898	COMB48	0.5865	0.4657	-0.0464	0.6023	0.45	-18.774
975	933	COMB48	0.7302	0.5338	-0.0422	0.7389	0.5251	-11.621
975	934	COMB48	0.7221	0.4265	-0.0267	0.7245	0.4241	-5.126
975	130	COMB48	0.5739	0.3642	-0.031	0.5783	0.3597	-8.23
975	898	COMB49	-0.0653	0.2917	-0.0373	0.2955	-0.0692	-84.101
975	933	COMB49	-0.0275	0.2986	-0.0394	0.3033	-0.0322	-83.206
975	934	COMB49	-0.0512	0.2058	-0.0397	0.2118	-0.0572	-81.415
975	130	COMB49	-0.0892	0.199	-0.0376	0.2038	-0.094	-82.691
975	898	COMB50	-5.0379	0.3561	0.0048	0.3561	-5.0379	89.949
975	933	COMB50	-4.8563	0.3673	-0.0109	0.3673	-4.8563	-89.881
975	934	COMB50	-4.9253	0.2087	-0.0227	0.2088	-4.9254	-89.747
975	130	COMB50	-5.1092	0.2018	-0.007	0.2018	-5.1092	-89.925
975	898	COMB51	0.353	0.6231	0.2591	0.7803	0.1958	58.767
975	933	COMB51	-0.1159	0.469	0.259	0.5672	-0.2141	69.233
975	934	COMB51	-0.1372	0.3964	0.2354	0.4854	-0.2262	69.287
975	130	COMB51	0.343	0.5421	0.2355	0.6982	0.1869	56.46
975	898	COMB52	8.3615	3.7875	0.0707	8.3626	3.7864	0.886
975	933	COMB52	7.1703	3.4048	0.0413	7.1707	3.4044	0.628
975	934	COMB52	7.0626	3.0349	-0.0241	7.0628	3.0348	-0.343
975	130	COMB52	8.1757	3.418	0.0053	8.1757	3.418	0.064
975	898	COMB53	0.2631	0.9966	-0.207	1.051	0.2087	-75.277
975	933	COMB53	0.8187	1.208	-0.2014	1.2934	0.7333	-67.013
975	934	COMB53	0.7988	0.9907	-0.1623	1.0833	0.7062	-60.301
975	130	COMB53	0.2272	0.7945	-0.168	0.8405	0.1812	-74.683
975	898	COMB54	-0.7192	0.1833	-0.1334	0.2026	-0.7385	-81.765
975	933	COMB54	-0.6026	0.2011	-0.1421	0.2255	-0.627	-80.263
975	934	COMB54	-0.6387	0.1281	-0.1444	0.1543	-0.665	-79.681
975	130	COMB54	-0.7553	0.11	-0.1357	0.1308	-0.7761	-81.294
975	898	COMB55	-4.7091	-0.0377	-0.0143	-0.0376	-4.7091	-89.825
975	933	COMB55	-4.6288	-0.0404	-0.0311	-0.0402	-4.629	-89.612
975	934	COMB55	-4.6766	-0.0741	-0.0396	-0.0738	-4.677	-89.508
975	130	COMB55	-4.7575	-0.0696	-0.0227	-0.0695	-4.7576	-89.722
975	898	COMB56	-0.2866	0.5816	0.2679	0.6576	-0.3626	74.16
975	933	COMB56	-0.8138	0.4196	0.2661	0.4745	-0.8688	78.332
975	934	COMB56	-0.8381	0.3557	0.2444	0.4038	-0.8862	78.868
975	130	COMB56	-0.299	0.5081	0.2462	0.5773	-0.3681	74.307
975	898	COMB57	8.0344	3.7825	0.0909	8.0364	3.7806	1.224
975	933	COMB57	6.7977	3.3956	0.0613	6.7988	3.3945	1.032
975	934	COMB57	6.6901	3.0284	-0.0019	6.6901	3.0284	-0.029
975	130	COMB57	7.849	3.415	0.0277	7.8491	3.4148	0.358

975	898	COMB58	1.3983	0.7096	-0.1812	1.4431	0.6648	-13.876
975	933	COMB58	1.865	0.9142	-0.1717	1.895	0.8841	-9.93
975	934	COMB58	1.8755	0.8049	-0.1275	1.8905	0.79	-6.7
975	130	COMB58	1.3937	0.6138	-0.137	1.417	0.5905	-9.68
975	898	COMB59	-0.7078	0.1956	-0.1226	0.212	-0.7242	-82.407
975	933	COMB59	-0.5991	0.2138	-0.1307	0.2343	-0.6196	-81.084
975	934	COMB59	-0.634	0.1391	-0.1322	0.1611	-0.656	-80.558
975	130	COMB59	-0.7429	0.1208	-0.1241	0.1383	-0.7604	-81.983
975	898	COMB60	-1.0717	0.1988	-0.0355	0.1998	-1.0727	-88.4
975	933	COMB60	-1.1156	0.1885	-0.0411	0.1898	-1.1169	-88.195
975	934	COMB60	-1.1459	0.1103	-0.0414	0.1116	-1.1472	-88.114
975	130	COMB60	-1.1009	0.119	-0.0358	0.1201	-1.1019	-88.322
975	898	COMB61	-0.7297	0.2667	0.0099	0.2668	-0.7298	89.43
975	933	COMB61	-0.8022	0.2568	0.0076	0.2569	-0.8023	89.586
975	934	COMB61	-0.8259	0.1689	0.01	0.169	-0.826	89.427
975	130	COMB61	-0.7526	0.1774	0.0122	0.1776	-0.7528	89.247
975	898	COMB62	-0.3634	0.3136	0.0272	0.3147	-0.3644	87.7
975	933	COMB62	-0.4269	0.3075	0.027	0.3085	-0.4279	87.895
975	934	COMB62	-0.4468	0.2123	0.0301	0.2136	-0.4481	87.39
975	130	COMB62	-0.3828	0.2174	0.0303	0.2189	-0.3843	87.116
975	898	COMB63	-0.0536	0.3355	0.0245	0.3371	-0.0551	86.415
975	933	COMB63	-0.0883	0.3336	0.0252	0.3351	-0.0898	86.594
975	934	COMB63	-0.1065	0.2338	0.0274	0.2359	-0.1087	85.425
975	130	COMB63	-0.0717	0.2353	0.0267	0.2376	-0.0741	85.07
975	898	COMB64	0.1003	0.3385	0.0155	0.3395	0.0993	86.285
975	933	COMB64	0.0873	0.3386	0.0163	0.3397	0.0863	86.295
975	934	COMB64	0.0691	0.2374	0.0175	0.2392	0.0673	84.122
975	130	COMB64	0.082	0.2372	0.0167	0.239	0.0803	83.926
975	898	COMB65	0.1535	0.3336	0.0068	0.3338	0.1533	87.832
975	933	COMB65	0.1533	0.3344	0.0074	0.3347	0.153	87.667
975	934	COMB65	0.1345	0.2334	0.0078	0.234	0.1339	85.541
975	130	COMB65	0.1347	0.2327	0.0072	0.2332	0.1342	85.824
975	898	COMB66	0.1652	0.3272	-0.000112	0.3272	0.1652	-89.96
975	933	COMB66	0.1728	0.3283	0.0001599	0.3283	0.1728	89.941
975	934	COMB66	0.1534	0.2279	-0.00006766	0.2279	0.1534	-89.948
975	130	COMB66	0.1457	0.227	-0.0003396	0.227	0.1457	-89.761
975	898	COMB67	-0.2424	0.3206	-0.2457	0.4127	-0.3346	-69.441
975	933	COMB67	-0.2259	0.3277	-0.2398	0.4171	-0.3153	-69.549
975	934	COMB67	-0.2297	0.2348	-0.2384	0.3354	-0.3303	-67.126
975	130	COMB67	-0.2462	0.2289	-0.2443	0.3321	-0.3495	-67.098
975	898	COMB68	0.1036	0.2564	-0.1918	0.3865	-0.0265	-55.858
975	933	COMB68	0.0821	0.2665	-0.1927	0.388	-0.0393	-57.789
975	934	COMB68	0.0638	0.1795	-0.1869	0.3174	-0.074	-53.594

975	130	COMB68	0.0831	0.1709	-0.1861	0.3182	-0.0642	-51.641
975	898	COMB69	0.327	0.198	-0.0563	0.3481	0.1769	-20.552
975	933	COMB69	0.3112	0.2009	-0.066	0.342	0.17	-25.054
975	934	COMB69	0.2723	0.123	-0.0636	0.2957	0.0996	-20.214
975	130	COMB69	0.287	0.1208	-0.0539	0.303	0.1048	-16.472
975	898	COMB70	0.2608	0.2319	0.0972	0.3446	0.1481	40.773
975	933	COMB70	0.2746	0.2213	0.0912	0.3429	0.1529	36.856
975	934	COMB70	0.2416	0.1393	0.0859	0.2905	0.0905	29.614
975	130	COMB70	0.2309	0.1483	0.0919	0.2904	0.0888	32.901
975	898	COMB71	0.0931	0.2945	0.1337	0.3612	0.0264	63.492
975	933	COMB71	0.103	0.2865	0.1349	0.3578	0.0316	62.114
975	934	COMB71	0.0867	0.1951	0.1308	0.2825	-0.0007457	56.253
975	130	COMB71	0.0782	0.2022	0.1297	0.2839	-0.0036	57.773
975	898	COMB72	-1.1192	0.2883	-0.869	0.7028	-1.5337	-64.501
975	933	COMB72	-1.0749	0.3162	-0.8451	0.7152	-1.4739	-64.728
975	934	COMB72	-1.0283	0.2482	-0.838	0.6633	-1.4434	-63.648
975	130	COMB72	-1.074	0.2247	-0.8619	0.6545	-1.5037	-63.497
975	898	COMB73	0.2619	0.0254	-0.6567	0.8109	-0.5236	-39.896
975	933	COMB73	0.1632	0.0664	-0.6634	0.7799	-0.5503	-42.912
975	934	COMB73	0.1439	0.0226	-0.6391	0.7253	-0.5588	-42.288
975	130	COMB73	0.2318	-0.0121	-0.6324	0.7539	-0.5342	-39.543
975	898	COMB74	1.054	-0.1729	-0.084	1.0598	-0.1787	-3.9
975	933	COMB74	1.0095	-0.1705	-0.1235	1.0223	-0.1833	-5.909
975	934	COMB74	0.9108	-0.181	-0.1188	0.9236	-0.1938	-6.137
975	130	COMB74	0.9539	-0.1829	-0.0794	0.9594	-0.1884	-3.974
975	898	COMB75	0.676	0.008	0.4671	0.9163	-0.2323	27.217
975	933	COMB75	0.7403	-0.0357	0.449	0.9457	-0.2411	24.585
975	934	COMB75	0.6815	-0.0721	0.4267	0.874	-0.2646	24.276
975	130	COMB75	0.6293	-0.0351	0.4448	0.8523	-0.2581	26.624
975	898	COMB76	0.0422	0.2439	0.5449	0.6972	-0.4111	50.245
975	933	COMB76	0.0789	0.2156	0.5521	0.7036	-0.4091	48.528
975	934	COMB76	0.0799	0.1437	0.5378	0.6505	-0.4269	46.696
975	130	COMB76	0.0475	0.1686	0.5305	0.642	-0.4259	48.254
975	898	COMB77	-1.3312	0.3115	-0.5633	0.4861	-1.5058	-72.778
975	933	COMB77	-1.2945	0.332	-0.5302	0.4896	-1.452	-73.449
975	934	COMB77	-1.2235	0.2722	-0.5253	0.4382	-1.3895	-72.458
975	130	COMB77	-1.2618	0.2548	-0.5584	0.4382	-1.4453	-71.816
975	898	COMB78	0.0994	0.0674	-0.4584	0.5421	-0.3752	-43.999
975	933	COMB78	-0.0173	0.1068	-0.4577	0.5067	-0.4171	-48.861
975	934	COMB78	-0.0176	0.0654	-0.4325	0.4584	-0.4106	-47.74
975	130	COMB78	0.0875	0.0316	-0.4331	0.4936	-0.3745	-43.156
975	898	COMB79	0.9806	-0.1347	0.0339	0.9817	-0.1358	1.739
975	933	COMB79	0.9208	-0.1318	-0.0006412	0.9208	-0.1318	-0.035

975	934	COMB79	0.8344	-0.1426	0.0056	0.8345	-0.1427	0.328
975	130	COMB79	0.8921	-0.1453	0.0401	0.8936	-0.1468	2.212
975	898	COMB80	0.6768	0.0378	0.5357	0.9811	-0.2664	29.593
975	933	COMB80	0.7336	-0.0046	0.5207	1.0028	-0.2737	27.333
975	934	COMB80	0.6826	-0.0424	0.4995	0.9373	-0.2971	27.017
975	130	COMB80	0.6373	-0.0068	0.5145	0.9222	-0.2917	28.981
975	898	COMB81	0.0762	0.2644	0.5835	0.7613	-0.4207	49.582
975	933	COMB81	0.1116	0.2375	0.5927	0.7705	-0.4214	48.031
975	934	COMB81	0.1173	0.1641	0.579	0.7201	-0.4387	46.157
975	130	COMB81	0.0858	0.1877	0.5698	0.7088	-0.4353	47.554
975	898	COMB82	-0.1517	0.3611	0.4327	0.6077	-0.3983	60.323
975	933	COMB82	-0.1598	0.3516	0.446	0.61	-0.4182	59.912
975	934	COMB82	-0.1446	0.2628	0.4429	0.5466	-0.4285	57.348
975	130	COMB82	-0.137	0.2707	0.4297	0.5424	-0.4087	57.691
975	898	COMB83	-0.0968	0.3836	0.2803	0.5126	-0.2257	65.299
975	933	COMB83	-0.1183	0.3821	0.2909	0.5155	-0.2517	65.349
975	934	COMB83	-0.1109	0.2857	0.2921	0.4405	-0.2656	62.084
975	130	COMB83	-0.0907	0.2865	0.2816	0.4368	-0.241	61.91
975	898	COMB84	-0.0136	0.3731	0.1614	0.4316	-0.0722	70.071
975	933	COMB84	-0.0363	0.3734	0.1681	0.4335	-0.0964	70.316
975	934	COMB84	-0.0393	0.274	0.1702	0.3486	-0.114	66.312
975	130	COMB84	-0.0176	0.2732	0.1636	0.3466	-0.0911	65.82
975	898	COMB85	0.0874	0.3622	0.0943	0.3915	0.0582	72.77
975	933	COMB85	0.0752	0.3637	0.0986	0.3942	0.0448	72.825
975	934	COMB85	0.0659	0.2627	0.1002	0.3048	0.0238	67.232
975	130	COMB85	0.0774	0.2611	0.096	0.3021	0.0364	66.873
975	898	COMB86	0.1339	0.3498	0.0535	0.3623	0.1213	76.817
975	933	COMB86	0.13	0.3514	0.0562	0.3648	0.1165	76.551
975	934	COMB86	0.1165	0.2503	0.0572	0.2714	0.0954	69.742
975	130	COMB86	0.1199	0.2487	0.0545	0.2687	0.0999	69.876
975	898	COMB87	0.1443	0.3395	0.0302	0.3441	0.1398	81.405
975	933	COMB87	0.1454	0.3409	0.0318	0.3459	0.1404	80.988
975	934	COMB87	0.1294	0.2402	0.0323	0.2489	0.1207	74.891
975	130	COMB87	0.128	0.2389	0.0307	0.2469	0.1201	75.533
975	898	COMB88	0.1417	0.3321	0.0169	0.3336	0.1403	84.978
975	933	COMB88	0.146	0.3332	0.0178	0.3349	0.1443	84.606
975	934	COMB88	0.1285	0.2331	0.0179	0.2361	0.1255	80.537
975	130	COMB88	0.124	0.2321	0.0169	0.2347	0.1214	81.29
975	898	COMB89	-0.9224	0.2631	-0.0055	0.2631	-0.9224	-89.732
975	933	COMB89	-0.8739	0.2672	-0.008	0.2672	-0.8739	-89.596
975	934	COMB89	-0.8973	0.1787	-0.0107	0.1788	-0.8975	-89.43
975	130	COMB89	-0.9464	0.1756	-0.0082	0.1757	-0.9465	-89.581
975	898	COMB90	0.0459	0.3605	0.0609	0.3719	0.0345	79.414

975	933	COMB90	-0.0448	0.3332	0.06	0.3425	-0.0541	81.198
975	934	COMB90	-0.0666	0.2414	0.0564	0.2514	-0.0766	79.95
975	130	COMB90	0.026	0.2676	0.0573	0.2805	0.0131	77.311
975	898	COMB91	1.8722	1.0845	0.017	1.8725	1.0841	1.233
975	933	COMB91	1.4033	0.9015	0.0194	1.404	0.9008	2.215
975	934	COMB91	1.3924	0.7478	-0.0174	1.3929	0.7473	-1.549
975	130	COMB91	1.8313	0.9183	-0.0199	1.8317	0.9179	-1.249
975	898	COMB92	0.5865	0.4657	-0.0464	0.6023	0.45	-18.774
975	933	COMB92	0.7302	0.5338	-0.0422	0.7389	0.5251	-11.621
975	934	COMB92	0.7221	0.4265	-0.0267	0.7245	0.4241	-5.126
975	130	COMB92	0.5739	0.3642	-0.031	0.5783	0.3597	-8.23
975	898	COMB93	-0.0653	0.2917	-0.0373	0.2955	-0.0692	-84.101
975	933	COMB93	-0.0275	0.2986	-0.0394	0.3033	-0.0322	-83.206
975	934	COMB93	-0.0512	0.2058	-0.0397	0.2118	-0.0572	-81.415
975	130	COMB93	-0.0892	0.199	-0.0376	0.2038	-0.094	-82.691
975	898	COMB94	-5.0379	0.3561	0.0048	0.3561	-5.0379	89.949
975	933	COMB94	-4.8563	0.3673	-0.0109	0.3673	-4.8563	-89.881
975	934	COMB94	-4.9253	0.2087	-0.0227	0.2088	-4.9254	-89.747
975	130	COMB94	-5.1092	0.2018	-0.007	0.2018	-5.1092	-89.925
975	898	COMB95	0.353	0.6231	0.2591	0.7803	0.1958	58.767
975	933	COMB95	-0.1159	0.469	0.259	0.5672	-0.2141	69.233
975	934	COMB95	-0.1372	0.3964	0.2354	0.4854	-0.2262	69.287
975	130	COMB95	0.343	0.5421	0.2355	0.6982	0.1869	56.46
975	898	COMB96	8.3615	3.7875	0.0707	8.3626	3.7864	0.886
975	933	COMB96	7.1703	3.4048	0.0413	7.1707	3.4044	0.628
975	934	COMB96	7.0626	3.0349	-0.0241	7.0628	3.0348	-0.343
975	130	COMB96	8.1757	3.418	0.0053	8.1757	3.418	0.064
975	898	COMB97	0.2631	0.9966	-0.207	1.051	0.2087	-75.277
975	933	COMB97	0.8187	1.208	-0.2014	1.2934	0.7333	-67.013
975	934	COMB97	0.7988	0.9907	-0.1623	1.0833	0.7062	-60.301
975	130	COMB97	0.2272	0.7945	-0.168	0.8405	0.1812	-74.683
975	898	COMB98	-0.7192	0.1833	-0.1334	0.2026	-0.7385	-81.765
975	933	COMB98	-0.6026	0.2011	-0.1421	0.2255	-0.627	-80.263
975	934	COMB98	-0.6387	0.1281	-0.1444	0.1543	-0.665	-79.681
975	130	COMB98	-0.7553	0.11	-0.1357	0.1308	-0.7761	-81.294
975	898	COMB99	-4.7091	-0.0377	-0.0143	-0.0376	-4.7091	-89.825
975	933	COMB99	-4.6288	-0.0404	-0.0311	-0.0402	-4.629	-89.612
975	934	COMB99	-4.6766	-0.0741	-0.0396	-0.0738	-4.677	-89.508
975	130	COMB99	-4.7575	-0.0696	-0.0227	-0.0695	-4.7576	-89.722
975	898	COMB100	-0.2866	0.5816	0.2679	0.6576	-0.3626	74.16
975	933	COMB100	-0.8138	0.4196	0.2661	0.4745	-0.8688	78.332
975	934	COMB100	-0.8381	0.3557	0.2444	0.4038	-0.8862	78.868
975	130	COMB100	-0.299	0.5081	0.2462	0.5773	-0.3681	74.307

975	898	COMB101	8.0344	3.7825	0.0909	8.0364	3.7806	1.224
975	933	COMB101	6.7977	3.3956	0.0613	6.7988	3.3945	1.032
975	934	COMB101	6.6901	3.0284	-0.0019	6.6901	3.0284	-0.029
975	130	COMB101	7.849	3.415	0.0277	7.8491	3.4148	0.358
975	898	COMB102	1.3983	0.7096	-0.1812	1.4431	0.6648	-13.876
975	933	COMB102	1.865	0.9142	-0.1717	1.895	0.8841	-9.93
975	934	COMB102	1.8755	0.8049	-0.1275	1.8905	0.79	-6.7
975	130	COMB102	1.3937	0.6138	-0.137	1.417	0.5905	-9.68
975	898	COMB103	-0.7078	0.1956	-0.1226	0.212	-0.7242	-82.407
975	933	COMB103	-0.5991	0.2138	-0.1307	0.2343	-0.6196	-81.084
975	934	COMB103	-0.634	0.1391	-0.1322	0.1611	-0.656	-80.558
975	130	COMB103	-0.7429	0.1208	-0.1241	0.1383	-0.7604	-81.983
975	898	COMB104	-1.0717	0.1988	-0.0355	0.1998	-1.0727	-88.4
975	933	COMB104	-1.1156	0.1885	-0.0411	0.1898	-1.1169	-88.195
975	934	COMB104	-1.1459	0.1103	-0.0414	0.1116	-1.1472	-88.114
975	130	COMB104	-1.1009	0.119	-0.0358	0.1201	-1.1019	-88.322
975	898	COMB105	-0.7297	0.2667	0.0099	0.2668	-0.7298	89.43
975	933	COMB105	-0.8022	0.2568	0.0076	0.2569	-0.8023	89.586
975	934	COMB105	-0.8259	0.1689	0.01	0.169	-0.826	89.427
975	130	COMB105	-0.7526	0.1774	0.0122	0.1776	-0.7528	89.247
975	898	COMB106	-0.3634	0.3136	0.0272	0.3147	-0.3644	87.7
975	933	COMB106	-0.4269	0.3075	0.027	0.3085	-0.4279	87.895
975	934	COMB106	-0.4468	0.2123	0.0301	0.2136	-0.4481	87.39
975	130	COMB106	-0.3828	0.2174	0.0303	0.2189	-0.3843	87.116
975	898	COMB107	-0.0536	0.3355	0.0245	0.3371	-0.0551	86.415
975	933	COMB107	-0.0883	0.3336	0.0252	0.3351	-0.0898	86.594
975	934	COMB107	-0.1065	0.2338	0.0274	0.2359	-0.1087	85.425
975	130	COMB107	-0.0717	0.2353	0.0267	0.2376	-0.0741	85.07
975	898	COMB108	0.1003	0.3385	0.0155	0.3395	0.0993	86.285
975	933	COMB108	0.0873	0.3386	0.0163	0.3397	0.0863	86.295
975	934	COMB108	0.0691	0.2374	0.0175	0.2392	0.0673	84.122
975	130	COMB108	0.082	0.2372	0.0167	0.239	0.0803	83.926
975	898	COMB109	0.1535	0.3336	0.0068	0.3338	0.1533	87.832
975	933	COMB109	0.1533	0.3344	0.0074	0.3347	0.153	87.667
975	934	COMB109	0.1345	0.2334	0.0078	0.234	0.1339	85.541
975	130	COMB109	0.1347	0.2327	0.0072	0.2332	0.1342	85.824
975	898	COMB110	0.1652	0.3272	-0.000112	0.3272	0.1652	-89.96
975	933	COMB110	0.1728	0.3283	0.0001599	0.3283	0.1728	89.941
975	934	COMB110	0.1534	0.2279	-0.00006766	0.2279	0.1534	-89.948
975	130	COMB110	0.1457	0.227	-0.0003396	0.227	0.1457	-89.761
975	898	COMB111	-0.2424	0.3206	-0.2457	0.4127	-0.3346	-69.441
975	933	COMB111	-0.2259	0.3277	-0.2398	0.4171	-0.3153	-69.549
975	934	COMB111	-0.2297	0.2348	-0.2384	0.3354	-0.3303	-67.126

975	130	COMB111	-0.2462	0.2289	-0.2443	0.3321	-0.3495	-67.098
975	898	COMB112	0.1036	0.2564	-0.1918	0.3865	-0.0265	-55.858
975	933	COMB112	0.0821	0.2665	-0.1927	0.388	-0.0393	-57.789
975	934	COMB112	0.0638	0.1795	-0.1869	0.3174	-0.074	-53.594
975	130	COMB112	0.0831	0.1709	-0.1861	0.3182	-0.0642	-51.641
975	898	COMB113	0.327	0.198	-0.0563	0.3481	0.1769	-20.552
975	933	COMB113	0.3112	0.2009	-0.066	0.342	0.17	-25.054
975	934	COMB113	0.2723	0.123	-0.0636	0.2957	0.0996	-20.214
975	130	COMB113	0.287	0.1208	-0.0539	0.303	0.1048	-16.472
975	898	COMB114	0.2608	0.2319	0.0972	0.3446	0.1481	40.773
975	933	COMB114	0.2746	0.2213	0.0912	0.3429	0.1529	36.856
975	934	COMB114	0.2416	0.1393	0.0859	0.2905	0.0905	29.614
975	130	COMB114	0.2309	0.1483	0.0919	0.2904	0.0888	32.901
975	898	COMB115	0.0931	0.2945	0.1337	0.3612	0.0264	63.492
975	933	COMB115	0.103	0.2865	0.1349	0.3578	0.0316	62.114
975	934	COMB115	0.0867	0.1951	0.1308	0.2825	-0.0007457	56.253
975	130	COMB115	0.0782	0.2022	0.1297	0.2839	-0.0036	57.773
975	898	COMB116	-1.1192	0.2883	-0.869	0.7028	-1.5337	-64.501
975	933	COMB116	-1.0749	0.3162	-0.8451	0.7152	-1.4739	-64.728
975	934	COMB116	-1.0283	0.2482	-0.838	0.6633	-1.4434	-63.648
975	130	COMB116	-1.074	0.2247	-0.8619	0.6545	-1.5037	-63.497
975	898	COMB117	0.2619	0.0254	-0.6567	0.8109	-0.5236	-39.896
975	933	COMB117	0.1632	0.0664	-0.6634	0.7799	-0.5503	-42.912
975	934	COMB117	0.1439	0.0226	-0.6391	0.7253	-0.5588	-42.288
975	130	COMB117	0.2318	-0.0121	-0.6324	0.7539	-0.5342	-39.543
975	898	COMB118	1.054	-0.1729	-0.084	1.0598	-0.1787	-3.9
975	933	COMB118	1.0095	-0.1705	-0.1235	1.0223	-0.1833	-5.909
975	934	COMB118	0.9108	-0.181	-0.1188	0.9236	-0.1938	-6.137
975	130	COMB118	0.9539	-0.1829	-0.0794	0.9594	-0.1884	-3.974
975	898	COMB119	0.676	0.008	0.4671	0.9163	-0.2323	27.217
975	933	COMB119	0.7403	-0.0357	0.449	0.9457	-0.2411	24.585
975	934	COMB119	0.6815	-0.0721	0.4267	0.874	-0.2646	24.276
975	130	COMB119	0.6293	-0.0351	0.4448	0.8523	-0.2581	26.624
975	898	COMB120	0.0422	0.2439	0.5449	0.6972	-0.4111	50.245
975	933	COMB120	0.0789	0.2156	0.5521	0.7036	-0.4091	48.528
975	934	COMB120	0.0799	0.1437	0.5378	0.6505	-0.4269	46.696
975	130	COMB120	0.0475	0.1686	0.5305	0.642	-0.4259	48.254
975	898	COMB121	-1.3312	0.3115	-0.5633	0.4861	-1.5058	-72.778
975	933	COMB121	-1.2945	0.332	-0.5302	0.4896	-1.452	-73.449
975	934	COMB121	-1.2235	0.2722	-0.5253	0.4382	-1.3895	-72.458
975	130	COMB121	-1.2618	0.2548	-0.5584	0.4382	-1.4453	-71.816
975	898	COMB122	0.0994	0.0674	-0.4584	0.5421	-0.3752	-43.999
975	933	COMB122	-0.0173	0.1068	-0.4577	0.5067	-0.4171	-48.861

975	934	COMB122	-0.0176	0.0654	-0.4325	0.4584	-0.4106	-47.74
975	130	COMB122	0.0875	0.0316	-0.4331	0.4936	-0.3745	-43.156
975	898	COMB123	0.9806	-0.1347	0.0339	0.9817	-0.1358	1.739
975	933	COMB123	0.9208	-0.1318	-0.0006412	0.9208	-0.1318	-0.035
975	934	COMB123	0.8344	-0.1426	0.0056	0.8345	-0.1427	0.328
975	130	COMB123	0.8921	-0.1453	0.0401	0.8936	-0.1468	2.212
975	898	COMB124	0.6768	0.0378	0.5357	0.9811	-0.2664	29.593
975	933	COMB124	0.7336	-0.0046	0.5207	1.0028	-0.2737	27.333
975	934	COMB124	0.6826	-0.0424	0.4995	0.9373	-0.2971	27.017
975	130	COMB124	0.6373	-0.0068	0.5145	0.9222	-0.2917	28.981
975	898	COMB125	0.0762	0.2644	0.5835	0.7613	-0.4207	49.582
975	933	COMB125	0.1116	0.2375	0.5927	0.7705	-0.4214	48.031
975	934	COMB125	0.1173	0.1641	0.579	0.7201	-0.4387	46.157
975	130	COMB125	0.0858	0.1877	0.5698	0.7088	-0.4353	47.554
975	898	COMB126	-0.1517	0.3611	0.4327	0.6077	-0.3983	60.323
975	933	COMB126	-0.1598	0.3516	0.446	0.61	-0.4182	59.912
975	934	COMB126	-0.1446	0.2628	0.4429	0.5466	-0.4285	57.348
975	130	COMB126	-0.137	0.2707	0.4297	0.5424	-0.4087	57.691
975	898	COMB127	-0.0968	0.3836	0.2803	0.5126	-0.2257	65.299
975	933	COMB127	-0.1183	0.3821	0.2909	0.5155	-0.2517	65.349
975	934	COMB127	-0.1109	0.2857	0.2921	0.4405	-0.2656	62.084
975	130	COMB127	-0.0907	0.2865	0.2816	0.4368	-0.241	61.91
975	898	COMB128	-0.0136	0.3731	0.1614	0.4316	-0.0722	70.071
975	933	COMB128	-0.0363	0.3734	0.1681	0.4335	-0.0964	70.316
975	934	COMB128	-0.0393	0.274	0.1702	0.3486	-0.114	66.312
975	130	COMB128	-0.0176	0.2732	0.1636	0.3466	-0.0911	65.82
975	898	COMB129	0.0874	0.3622	0.0943	0.3915	0.0582	72.77
975	933	COMB129	0.0752	0.3637	0.0986	0.3942	0.0448	72.825
975	934	COMB129	0.0659	0.2627	0.1002	0.3048	0.0238	67.232
975	130	COMB129	0.0774	0.2611	0.096	0.3021	0.0364	66.873
975	898	COMB130	0.1339	0.3498	0.0535	0.3623	0.1213	76.817
975	933	COMB130	0.13	0.3514	0.0562	0.3648	0.1165	76.551
975	934	COMB130	0.1165	0.2503	0.0572	0.2714	0.0954	69.742
975	130	COMB130	0.1199	0.2487	0.0545	0.2687	0.0999	69.876
975	898	COMB131	0.1443	0.3395	0.0302	0.3441	0.1398	81.405
975	933	COMB131	0.1454	0.3409	0.0318	0.3459	0.1404	80.988
975	934	COMB131	0.1294	0.2402	0.0323	0.2489	0.1207	74.891
975	130	COMB131	0.128	0.2389	0.0307	0.2469	0.1201	75.533
975	898	COMB132	0.1417	0.3321	0.0169	0.3336	0.1403	84.978
975	933	COMB132	0.146	0.3332	0.0178	0.3349	0.1443	84.606
975	934	COMB132	0.1285	0.2331	0.0179	0.2361	0.1255	80.537
975	130	COMB132	0.124	0.2321	0.0169	0.2347	0.1214	81.29
2491	2067	COMB1	0.0087	-0.0413	0.0152	0.0129	-0.0456	15.64

2491	2102	COMB1	0.0039	-0.0476	0.0178	0.0095	-0.0531	17.316
2491	2103	COMB1	0.0016	-0.0962	0.0152	0.0039	-0.0985	8.643
2491	541	COMB1	0.0045	-0.089	0.0126	0.0062	-0.0906	7.555
2491	2067	COMB2	0.009	-0.0407	0.0152	0.0133	-0.045	15.785
2491	2102	COMB2	0.004	-0.047	0.0178	0.0096	-0.0526	17.488
2491	2103	COMB2	0.0017	-0.0956	0.0153	0.0041	-0.0979	8.712
2491	541	COMB2	0.0048	-0.0883	0.0127	0.0065	-0.09	7.616
2491	2067	COMB3	0.0091	-0.0395	0.0154	0.0135	-0.0439	16.174
2491	2102	COMB3	0.004	-0.0458	0.0179	0.0098	-0.0516	17.874
2491	2103	COMB3	0.0017	-0.0944	0.0154	0.0041	-0.0968	8.861
2491	541	COMB3	0.0049	-0.0871	0.0128	0.0067	-0.0888	7.764
2491	2067	COMB4	0.0086	-0.0372	0.0156	0.0134	-0.042	17.116
2491	2102	COMB4	0.0038	-0.0436	0.0182	0.01	-0.0498	18.71
2491	2103	COMB4	0.0015	-0.0921	0.0155	0.004	-0.0947	9.173
2491	541	COMB4	0.0044	-0.0848	0.013	0.0063	-0.0866	8.101
2491	2067	COMB5	0.0069	-0.0339	0.0159	0.0123	-0.0393	18.997
2491	2102	COMB5	0.0032	-0.0402	0.0185	0.01	-0.047	20.209
2491	2103	COMB5	0.0008748	-0.0887	0.0158	0.0036	-0.0914	9.713
2491	541	COMB5	0.0027	-0.0814	0.0132	0.0047	-0.0834	8.733
2491	2067	COMB6	-0.0044	-0.1442	0.0368	0.0047	-0.1533	13.883
2491	2102	COMB6	-0.0035	-0.157	0.0429	0.0077	-0.1681	14.596
2491	2103	COMB6	-0.0088	-0.2706	0.0366	-0.0038	-0.2756	7.821
2491	541	COMB6	-0.014	-0.2556	0.0306	-0.0102	-0.2594	7.101
2491	2067	COMB7	0.0001788	-0.0303	0.0162	0.0072	-0.0374	23.396
2491	2102	COMB7	0.0008059	-0.036	0.0188	0.0087	-0.0439	22.838
2491	2103	COMB7	-0.0015	-0.0845	0.0161	0.0015	-0.0875	10.585
2491	541	COMB7	-0.004	-0.0779	0.0135	-0.0016	-0.0803	10.026
2491	2067	COMB8	-0.0043	-0.0338	0.0159	0.0026	-0.0407	23.572
2491	2102	COMB8	-0.0007561	-0.0387	0.0185	0.0068	-0.0463	22.134
2491	2103	COMB8	-0.003	-0.0875	0.0158	-0.000177	-0.0903	10.264
2491	541	COMB8	-0.0084	-0.0816	0.0132	-0.0061	-0.0839	9.911
2491	2067	COMB9	-0.0124	-0.1584	0.0351	-0.0044	-0.1663	12.832
2491	2102	COMB9	-0.0062	-0.1695	0.0413	0.0036	-0.1794	13.409
2491	2103	COMB9	-0.0114	-0.2838	0.0353	-0.0069	-0.2883	7.268
2491	541	COMB9	-0.0218	-0.2705	0.0291	-0.0184	-0.2739	6.585
2491	2067	COMB10	0.0134	-0.0699	0.009	0.0143	-0.0709	6.095
2491	2102	COMB10	0.0059	-0.0749	0.0122	0.0077	-0.0767	8.372
2491	2103	COMB10	0.0042	-0.126	0.0105	0.005	-0.1268	4.574
2491	541	COMB10	0.0104	-0.1204	0.0073	0.0108	-0.1208	3.192
2491	2067	COMB11	0.0616	-0.0959	-0.0137	0.0628	-0.0971	-4.943
2491	2102	COMB11	0.0238	-0.103	-0.0073	0.0242	-0.1034	-3.269
2491	2103	COMB11	0.0252	-0.1721	-0.0064	0.0254	-0.1723	-1.866
2491	541	COMB11	0.064	-0.1677	-0.0129	0.0647	-0.1684	-3.176

2491	2067	COMB12	0.076	-0.2069	0.0008611	0.076	-0.2069	0.174
2491	2102	COMB12	0.0341	-0.2005	0.0049	0.0342	-0.2006	1.196
2491	2103	COMB12	0.0181	-0.4093	0.0088	0.0183	-0.4094	1.181
2491	541	COMB12	0.0295	-0.4104	0.0048	0.0296	-0.4104	0.622
2491	2067	COMB13	-0.052	-0.0393	0.0152	-0.0292	-0.0621	56.347
2491	2102	COMB13	-0.0175	-0.038	0.0181	-0.007	-0.0486	30.209
2491	2103	COMB13	-0.0196	-0.0881	0.0154	-0.0163	-0.0914	12.097
2491	541	COMB13	-0.0556	-0.0886	0.0125	-0.0514	-0.0928	18.617
2491	2067	COMB14	-0.0329	-0.1334	0.0041	-0.0328	-0.1336	2.359
2491	2102	COMB14	-0.0099	-0.1304	0.0076	-0.0095	-0.1309	3.597
2491	2103	COMB14	-0.0114	-0.1831	0.0068	-0.0111	-0.1834	2.252
2491	541	COMB14	-0.0354	-0.1856	0.0033	-0.0353	-0.1857	1.261
2491	2067	COMB15	0.0782	-0.2708	-0.0256	0.0801	-0.2727	-4.177
2491	2102	COMB15	0.0311	-0.273	-0.0197	0.0323	-0.2743	-3.695
2491	2103	COMB15	0.0322	-0.3364	-0.0162	0.0329	-0.3371	-2.518
2491	541	COMB15	0.0806	-0.3357	-0.0221	0.0818	-0.3369	-3.036
2491	2067	COMB16	0.3395	-0.402	-0.1411	0.3654	-0.428	-10.419
2491	2102	COMB16	0.1273	-0.4176	-0.1179	0.1518	-0.442	-11.703
2491	2103	COMB16	0.1443	-0.5816	-0.1019	0.1583	-0.5957	-7.84
2491	541	COMB16	0.3676	-0.585	-0.1251	0.3838	-0.6012	-7.356
2491	2067	COMB17	0.1177	-1.0357	0.2423	0.1665	-1.0846	11.396
2491	2102	COMB17	0.0913	-1.0187	0.2228	0.1343	-1.0617	10.936
2491	2103	COMB17	-0.0451	-1.8384	0.2118	-0.0204	-1.8631	6.644
2491	541	COMB17	-0.1567	-1.787	0.2313	-0.1245	-1.8192	7.921
2491	2067	COMB18	-0.0546	-0.0447	0.0146	-0.0342	-0.0651	54.3
2491	2102	COMB18	-0.0184	-0.0429	0.0176	-0.0092	-0.0521	27.524
2491	2103	COMB18	-0.0204	-0.0932	0.015	-0.0174	-0.0962	11.179
2491	541	COMB18	-0.0581	-0.0942	0.0121	-0.0545	-0.0979	16.874
2491	2067	COMB19	-0.033	-0.1486	0.0027	-0.033	-0.1487	1.317
2491	2102	COMB19	-0.0098	-0.145	0.0062	-0.0095	-0.1453	2.617
2491	2103	COMB19	-0.0112	-0.1981	0.0056	-0.011	-0.1983	1.715
2491	541	COMB19	-0.0354	-0.2013	0.0021	-0.0353	-0.2013	0.715
2491	2067	COMB20	0.0861	-0.3001	-0.0285	0.0882	-0.3021	-4.194
2491	2102	COMB20	0.0342	-0.302	-0.0224	0.0357	-0.3035	-3.803
2491	2103	COMB20	0.0354	-0.3661	-0.0185	0.0362	-0.3669	-2.629
2491	541	COMB20	0.0887	-0.3655	-0.0245	0.09	-0.3669	-3.078
2491	2067	COMB21	0.3632	-0.444	-0.1452	0.3885	-0.4693	-9.891
2491	2102	COMB21	0.1362	-0.4609	-0.1219	0.1601	-0.4849	-11.106
2491	2103	COMB21	0.1532	-0.6255	-0.1051	0.1672	-0.6394	-7.555
2491	541	COMB21	0.3915	-0.6276	-0.1284	0.4075	-0.6435	-7.071
2491	2067	COMB22	0.1639	-1.0746	0.2386	0.2083	-1.119	10.536
2491	2102	COMB22	0.108	-1.0618	0.219	0.1477	-1.1015	10.266
2491	2103	COMB22	-0.0284	-1.8814	0.2087	-0.0052	-1.9046	6.348

2491	541	COMB22	-0.1105	-1.8257	0.2283	-0.0807	-1.8555	7.454
2491	2067	COMB23	0.0084	-0.0414	0.0143	0.0122	-0.0452	14.895
2491	2102	COMB23	0.0038	-0.0477	0.0169	0.0088	-0.0527	16.608
2491	2103	COMB23	0.0015	-0.0962	0.0143	0.0036	-0.0982	8.151
2491	541	COMB23	0.0043	-0.0889	0.0117	0.0058	-0.0904	7.038
2491	2067	COMB24	0.0085	-0.0414	0.0137	0.012	-0.0449	14.402
2491	2102	COMB24	0.0038	-0.0477	0.0163	0.0086	-0.0524	16.165
2491	2103	COMB24	0.0016	-0.0961	0.0137	0.0034	-0.098	7.85
2491	541	COMB24	0.0044	-0.0888	0.0111	0.0057	-0.0901	6.714
2491	2067	COMB25	0.0084	-0.0414	0.0126	0.0114	-0.0444	13.46
2491	2102	COMB25	0.0038	-0.0477	0.0152	0.0079	-0.0519	15.298
2491	2103	COMB25	0.0015	-0.0959	0.0126	0.0031	-0.0975	7.26
2491	541	COMB25	0.0044	-0.0886	0.01	0.0054	-0.0896	6.086
2491	2067	COMB26	0.0079	-0.0414	0.0105	0.01	-0.0435	11.545
2491	2102	COMB26	0.0035	-0.0478	0.0131	0.0067	-0.0509	13.508
2491	2103	COMB26	0.0013	-0.0956	0.0104	0.0024	-0.0967	6.072
2491	541	COMB26	0.0039	-0.0882	0.0078	0.0046	-0.0889	4.829
2491	2067	COMB27	0.0064	-0.0417	0.0064	0.0073	-0.0426	7.389
2491	2102	COMB27	0.0029	-0.0482	0.0089	0.0045	-0.0497	9.641
2491	2103	COMB27	0.0008111	-0.0953	0.0062	0.0012	-0.0957	3.681
2491	541	COMB27	0.0027	-0.0879	0.0036	0.0028	-0.0881	2.285
2491	2067	COMB28	0.0037	-0.0472	-0.0057	0.0043	-0.0478	-6.351
2491	2102	COMB28	0.0017	-0.0537	-0.0031	0.0019	-0.0539	-3.215
2491	2103	COMB28	-0.0001184	-0.099	-0.006	0.0002449	-0.0994	-3.463
2491	541	COMB28	0.0004586	-0.0916	-0.0086	0.0013	-0.0924	-5.297
2491	2067	COMB29	-0.0007483	-0.0529	-0.0225	0.0076	-0.0613	-20.404
2491	2102	COMB29	-0.0001569	-0.0596	-0.0199	0.0059	-0.0657	-16.877
2491	2103	COMB29	-0.0016	-0.1026	-0.023	0.0034	-0.1076	-12.249
2491	541	COMB29	-0.0032	-0.0951	-0.0256	0.0035	-0.1018	-14.579
2491	2067	COMB30	-0.007	-0.0654	-0.0521	0.0236	-0.0959	-30.349
2491	2102	COMB30	-0.0029	-0.0726	-0.0493	0.0226	-0.0981	-27.39
2491	2103	COMB30	-0.0037	-0.112	-0.0528	0.0178	-0.1335	-22.154
2491	541	COMB30	-0.0081	-0.1044	-0.0556	0.0174	-0.1298	-24.555
2491	2067	COMB31	-0.0128	-0.0842	-0.0992	0.0569	-0.154	-35.114
2491	2102	COMB31	-0.006	-0.0926	-0.0961	0.0561	-0.1547	-32.874
2491	2103	COMB31	-0.0057	-0.128	-0.1002	0.0506	-0.1843	-29.312
2491	541	COMB31	-0.0118	-0.1196	-0.1034	0.0509	-0.1823	-31.235
2491	2067	COMB32	-0.0117	-0.0938	-0.1579	0.1104	-0.2159	-37.72
2491	2102	COMB32	-0.0072	-0.1054	-0.1538	0.1052	-0.2178	-36.145
2491	2103	COMB32	-0.0053	-0.141	-0.1589	0.0996	-0.2459	-33.437
2491	541	COMB32	-0.0079	-0.1304	-0.163	0.1049	-0.2433	-34.7
2491	2067	COMB33	0.0165	-0.0437	-0.1784	0.1673	-0.1945	-40.207
2491	2102	COMB33	0.0016	-0.0603	-0.1713	0.1448	-0.2035	-39.876

2491	2103	COMB33	0.0052	-0.1227	-0.1762	0.1287	-0.2462	-35.029
2491	541	COMB33	0.0219	-0.1102	-0.1832	0.1506	-0.2389	-35.094
2491	2067	COMB34	0.1314	0.0725	0.156	0.2607	-0.0569	39.656
2491	2102	COMB34	0.061	0.0917	0.1568	0.2339	-0.0812	47.798
2491	2103	COMB34	0.0391	-0.1182	0.1679	0.1459	-0.2249	32.445
2491	541	COMB34	0.0746	-0.1295	0.1671	0.1683	-0.2233	29.297
2491	2067	COMB35	-0.056	-0.1411	-0.2409	0.146	-0.3432	-39.992
2491	2102	COMB35	-0.024	-0.1498	-0.2373	0.1586	-0.3324	-37.574
2491	2103	COMB35	-0.0205	-0.1658	-0.2434	0.1609	-0.3471	-36.69
2491	541	COMB35	-0.0485	-0.1581	-0.247	0.1497	-0.3563	-38.744
2491	2067	COMB36	-0.0687	-0.2173	-0.4089	0.2726	-0.5586	-39.85
2491	2102	COMB36	-0.0321	-0.2315	-0.4037	0.284	-0.5476	-38.065
2491	2103	COMB36	-0.0245	-0.2372	-0.4119	0.2945	-0.5562	-37.759
2491	541	COMB36	-0.0534	-0.2262	-0.4171	0.2862	-0.5657	-39.149
2491	2067	COMB37	-0.033	-0.2293	-0.5802	0.4573	-0.7196	-40.2
2491	2102	COMB37	-0.0246	-0.2577	-0.5706	0.4412	-0.7235	-39.23
2491	2103	COMB37	-0.0118	-0.2812	-0.5814	0.4503	-0.7433	-38.476
2491	541	COMB37	-0.0093	-0.2604	-0.591	0.4694	-0.7391	-39.003
2491	2067	COMB38	0.1551	0.0879	-0.4547	0.5774	-0.3344	-42.884
2491	2102	COMB38	0.0415	0.0421	-0.4315	0.4733	-0.3897	-45.02
2491	2103	COMB38	0.0572	-0.1457	-0.4367	0.404	-0.4926	-38.462
2491	541	COMB38	0.1747	-0.121	-0.4599	0.5099	-0.4562	-36.088
2491	2067	COMB39	0.5247	0.5431	1.7453	2.2793	-1.2114	45.151
2491	2102	COMB39	0.3032	0.6712	1.7155	2.2126	-1.2382	48.061
2491	2103	COMB39	0.1391	-0.2169	1.7656	1.7356	-1.8135	42.122
2491	541	COMB39	0.2026	-0.2652	1.7953	1.7792	-1.8418	41.289
2491	2067	COMB40	-0.0558	-0.1378	-0.2293	0.1362	-0.3298	-39.93
2491	2102	COMB40	-0.0237	-0.1461	-0.2257	0.149	-0.3188	-37.415
2491	2103	COMB40	-0.0204	-0.164	-0.2317	0.1503	-0.3348	-36.387
2491	541	COMB40	-0.0487	-0.1568	-0.2353	0.1386	-0.3441	-38.534
2491	2067	COMB41	-0.0659	-0.214	-0.3878	0.2549	-0.5348	-39.596
2491	2102	COMB41	-0.0307	-0.2274	-0.3826	0.2659	-0.5241	-37.789
2491	2103	COMB41	-0.0234	-0.2369	-0.3904	0.2746	-0.5349	-37.355
2491	541	COMB41	-0.0515	-0.2264	-0.3957	0.2663	-0.5442	-38.767
2491	2067	COMB42	-0.0237	-0.2239	-0.5408	0.4261	-0.6738	-39.757
2491	2102	COMB42	-0.0205	-0.2515	-0.5312	0.4076	-0.6796	-38.866
2491	2103	COMB42	-0.0085	-0.2818	-0.5413	0.4131	-0.7033	-37.915
2491	541	COMB42	-0.0017	-0.2615	-0.5509	0.4344	-0.6976	-38.367
2491	2067	COMB43	0.177	0.1026	-0.3806	0.5222	-0.2426	-42.208
2491	2102	COMB43	0.0508	0.0577	-0.3575	0.4118	-0.3032	-45.275
2491	2103	COMB43	0.0649	-0.1419	-0.3614	0.3374	-0.4144	-37.018
2491	541	COMB43	0.1933	-0.1176	-0.3845	0.4526	-0.3769	-33.995
2491	2067	COMB44	0.5663	0.5848	1.8825	2.458	-1.307	45.141

2491	2102	COMB44	0.3206	0.7137	1.8524	2.38	-1.3456	48.028
2491	2103	COMB44	0.1534	-0.1942	1.9046	1.8921	-1.9328	42.393
2491	541	COMB44	0.2379	-0.2424	1.9346	1.9472	-1.9517	41.462
2491	2067	COMB45	0.0087	-0.0413	0.0152	0.0129	-0.0456	15.64
2491	2102	COMB45	0.0039	-0.0476	0.0178	0.0095	-0.0531	17.316
2491	2103	COMB45	0.0016	-0.0962	0.0152	0.0039	-0.0985	8.643
2491	541	COMB45	0.0045	-0.089	0.0126	0.0062	-0.0906	7.555
2491	2067	COMB46	0.009	-0.0407	0.0152	0.0133	-0.045	15.785
2491	2102	COMB46	0.004	-0.047	0.0178	0.0096	-0.0526	17.488
2491	2103	COMB46	0.0017	-0.0956	0.0153	0.0041	-0.0979	8.712
2491	541	COMB46	0.0048	-0.0883	0.0127	0.0065	-0.09	7.616
2491	2067	COMB47	0.0091	-0.0395	0.0154	0.0135	-0.0439	16.174
2491	2102	COMB47	0.004	-0.0458	0.0179	0.0098	-0.0516	17.874
2491	2103	COMB47	0.0017	-0.0944	0.0154	0.0041	-0.0968	8.861
2491	541	COMB47	0.0049	-0.0871	0.0128	0.0067	-0.0888	7.764
2491	2067	COMB48	0.0086	-0.0372	0.0156	0.0134	-0.042	17.116
2491	2102	COMB48	0.0038	-0.0436	0.0182	0.01	-0.0498	18.71
2491	2103	COMB48	0.0015	-0.0921	0.0155	0.004	-0.0947	9.173
2491	541	COMB48	0.0044	-0.0848	0.013	0.0063	-0.0866	8.101
2491	2067	COMB49	0.0069	-0.0339	0.0159	0.0123	-0.0393	18.997
2491	2102	COMB49	0.0032	-0.0402	0.0185	0.01	-0.047	20.209
2491	2103	COMB49	0.0008748	-0.0887	0.0158	0.0036	-0.0914	9.713
2491	541	COMB49	0.0027	-0.0814	0.0132	0.0047	-0.0834	8.733
2491	2067	COMB50	-0.0044	-0.1442	0.0368	0.0047	-0.1533	13.883
2491	2102	COMB50	-0.0035	-0.157	0.0429	0.0077	-0.1681	14.596
2491	2103	COMB50	-0.0088	-0.2706	0.0366	-0.0038	-0.2756	7.821
2491	541	COMB50	-0.014	-0.2556	0.0306	-0.0102	-0.2594	7.101
2491	2067	COMB51	0.0001788	-0.0303	0.0162	0.0072	-0.0374	23.396
2491	2102	COMB51	0.0008059	-0.036	0.0188	0.0087	-0.0439	22.838
2491	2103	COMB51	-0.0015	-0.0845	0.0161	0.0015	-0.0875	10.585
2491	541	COMB51	-0.004	-0.0779	0.0135	-0.0016	-0.0803	10.026
2491	2067	COMB52	-0.0043	-0.0338	0.0159	0.0026	-0.0407	23.572
2491	2102	COMB52	-0.0007561	-0.0387	0.0185	0.0068	-0.0463	22.134
2491	2103	COMB52	-0.003	-0.0875	0.0158	-0.000177	-0.0903	10.264
2491	541	COMB52	-0.0084	-0.0816	0.0132	-0.0061	-0.0839	9.911
2491	2067	COMB53	-0.0124	-0.1584	0.0351	-0.0044	-0.1663	12.832
2491	2102	COMB53	-0.0062	-0.1695	0.0413	0.0036	-0.1794	13.409
2491	2103	COMB53	-0.0114	-0.2838	0.0353	-0.0069	-0.2883	7.268
2491	541	COMB53	-0.0218	-0.2705	0.0291	-0.0184	-0.2739	6.585
2491	2067	COMB54	0.0134	-0.0699	0.009	0.0143	-0.0709	6.095
2491	2102	COMB54	0.0059	-0.0749	0.0122	0.0077	-0.0767	8.372
2491	2103	COMB54	0.0042	-0.126	0.0105	0.005	-0.1268	4.574
2491	541	COMB54	0.0104	-0.1204	0.0073	0.0108	-0.1208	3.192

2491	2067	COMB55	0.0616	-0.0959	-0.0137	0.0628	-0.0971	-4.943
2491	2102	COMB55	0.0238	-0.103	-0.0073	0.0242	-0.1034	-3.269
2491	2103	COMB55	0.0252	-0.1721	-0.0064	0.0254	-0.1723	-1.866
2491	541	COMB55	0.064	-0.1677	-0.0129	0.0647	-0.1684	-3.176
2491	2067	COMB56	0.076	-0.2069	0.0008611	0.076	-0.2069	0.174
2491	2102	COMB56	0.0341	-0.2005	0.0049	0.0342	-0.2006	1.196
2491	2103	COMB56	0.0181	-0.4093	0.0088	0.0183	-0.4094	1.181
2491	541	COMB56	0.0295	-0.4104	0.0048	0.0296	-0.4104	0.622
2491	2067	COMB57	-0.052	-0.0393	0.0152	-0.0292	-0.0621	56.347
2491	2102	COMB57	-0.0175	-0.038	0.0181	-0.007	-0.0486	30.209
2491	2103	COMB57	-0.0196	-0.0881	0.0154	-0.0163	-0.0914	12.097
2491	541	COMB57	-0.0556	-0.0886	0.0125	-0.0514	-0.0928	18.617
2491	2067	COMB58	-0.0329	-0.1334	0.0041	-0.0328	-0.1336	2.359
2491	2102	COMB58	-0.0099	-0.1304	0.0076	-0.0095	-0.1309	3.597
2491	2103	COMB58	-0.0114	-0.1831	0.0068	-0.0111	-0.1834	2.252
2491	541	COMB58	-0.0354	-0.1856	0.0033	-0.0353	-0.1857	1.261
2491	2067	COMB59	0.0782	-0.2708	-0.0256	0.0801	-0.2727	-4.177
2491	2102	COMB59	0.0311	-0.273	-0.0197	0.0323	-0.2743	-3.695
2491	2103	COMB59	0.0322	-0.3364	-0.0162	0.0329	-0.3371	-2.518
2491	541	COMB59	0.0806	-0.3357	-0.0221	0.0818	-0.3369	-3.036
2491	2067	COMB60	0.3395	-0.402	-0.1411	0.3654	-0.428	-10.419
2491	2102	COMB60	0.1273	-0.4176	-0.1179	0.1518	-0.442	-11.703
2491	2103	COMB60	0.1443	-0.5816	-0.1019	0.1583	-0.5957	-7.84
2491	541	COMB60	0.3676	-0.585	-0.1251	0.3838	-0.6012	-7.356
2491	2067	COMB61	0.1177	-1.0357	0.2423	0.1665	-1.0846	11.396
2491	2102	COMB61	0.0913	-1.0187	0.2228	0.1343	-1.0617	10.936
2491	2103	COMB61	-0.0451	-1.8384	0.2118	-0.0204	-1.8631	6.644
2491	541	COMB61	-0.1567	-1.787	0.2313	-0.1245	-1.8192	7.921
2491	2067	COMB62	-0.0546	-0.0447	0.0146	-0.0342	-0.0651	54.3
2491	2102	COMB62	-0.0184	-0.0429	0.0176	-0.0092	-0.0521	27.524
2491	2103	COMB62	-0.0204	-0.0932	0.015	-0.0174	-0.0962	11.179
2491	541	COMB62	-0.0581	-0.0942	0.0121	-0.0545	-0.0979	16.874
2491	2067	COMB63	-0.033	-0.1486	0.0027	-0.033	-0.1487	1.317
2491	2102	COMB63	-0.0098	-0.145	0.0062	-0.0095	-0.1453	2.617
2491	2103	COMB63	-0.0112	-0.1981	0.0056	-0.011	-0.1983	1.715
2491	541	COMB63	-0.0354	-0.2013	0.0021	-0.0353	-0.2013	0.715
2491	2067	COMB64	0.0861	-0.3001	-0.0285	0.0882	-0.3021	-4.194
2491	2102	COMB64	0.0342	-0.302	-0.0224	0.0357	-0.3035	-3.803
2491	2103	COMB64	0.0354	-0.3661	-0.0185	0.0362	-0.3669	-2.629
2491	541	COMB64	0.0887	-0.3655	-0.0245	0.09	-0.3669	-3.078
2491	2067	COMB65	0.3632	-0.444	-0.1452	0.3885	-0.4693	-9.891
2491	2102	COMB65	0.1362	-0.4609	-0.1219	0.1601	-0.4849	-11.106
2491	2103	COMB65	0.1532	-0.6255	-0.1051	0.1672	-0.6394	-7.555

2491	541	COMB65	0.3915	-0.6276	-0.1284	0.4075	-0.6435	-7.071
2491	2067	COMB66	0.1639	-1.0746	0.2386	0.2083	-1.119	10.536
2491	2102	COMB66	0.108	-1.0618	0.219	0.1477	-1.1015	10.266
2491	2103	COMB66	-0.0284	-1.8814	0.2087	-0.0052	-1.9046	6.348
2491	541	COMB66	-0.1105	-1.8257	0.2283	-0.0807	-1.8555	7.454
2491	2067	COMB67	0.0084	-0.0414	0.0143	0.0122	-0.0452	14.895
2491	2102	COMB67	0.0038	-0.0477	0.0169	0.0088	-0.0527	16.608
2491	2103	COMB67	0.0015	-0.0962	0.0143	0.0036	-0.0982	8.151
2491	541	COMB67	0.0043	-0.0889	0.0117	0.0058	-0.0904	7.038
2491	2067	COMB68	0.0085	-0.0414	0.0137	0.012	-0.0449	14.402
2491	2102	COMB68	0.0038	-0.0477	0.0163	0.0086	-0.0524	16.165
2491	2103	COMB68	0.0016	-0.0961	0.0137	0.0034	-0.098	7.85
2491	541	COMB68	0.0044	-0.0888	0.0111	0.0057	-0.0901	6.714
2491	2067	COMB69	0.0084	-0.0414	0.0126	0.0114	-0.0444	13.46
2491	2102	COMB69	0.0038	-0.0477	0.0152	0.0079	-0.0519	15.298
2491	2103	COMB69	0.0015	-0.0959	0.0126	0.0031	-0.0975	7.26
2491	541	COMB69	0.0044	-0.0886	0.01	0.0054	-0.0896	6.086
2491	2067	COMB70	0.0079	-0.0414	0.0105	0.01	-0.0435	11.545
2491	2102	COMB70	0.0035	-0.0478	0.0131	0.0067	-0.0509	13.508
2491	2103	COMB70	0.0013	-0.0956	0.0104	0.0024	-0.0967	6.072
2491	541	COMB70	0.0039	-0.0882	0.0078	0.0046	-0.0889	4.829
2491	2067	COMB71	0.0064	-0.0417	0.0064	0.0073	-0.0426	7.389
2491	2102	COMB71	0.0029	-0.0482	0.0089	0.0045	-0.0497	9.641
2491	2103	COMB71	0.0008111	-0.0953	0.0062	0.0012	-0.0957	3.681
2491	541	COMB71	0.0027	-0.0879	0.0036	0.0028	-0.0881	2.285
2491	2067	COMB72	0.0037	-0.0472	-0.0057	0.0043	-0.0478	-6.351
2491	2102	COMB72	0.0017	-0.0537	-0.0031	0.0019	-0.0539	-3.215
2491	2103	COMB72	-0.0001184	-0.099	-0.006	0.0002449	-0.0994	-3.463
2491	541	COMB72	0.0004586	-0.0916	-0.0086	0.0013	-0.0924	-5.297
2491	2067	COMB73	-0.0007483	-0.0529	-0.0225	0.0076	-0.0613	-20.404
2491	2102	COMB73	-0.0001569	-0.0596	-0.0199	0.0059	-0.0657	-16.877
2491	2103	COMB73	-0.0016	-0.1026	-0.023	0.0034	-0.1076	-12.249
2491	541	COMB73	-0.0032	-0.0951	-0.0256	0.0035	-0.1018	-14.579
2491	2067	COMB74	-0.007	-0.0654	-0.0521	0.0236	-0.0959	-30.349
2491	2102	COMB74	-0.0029	-0.0726	-0.0493	0.0226	-0.0981	-27.39
2491	2103	COMB74	-0.0037	-0.112	-0.0528	0.0178	-0.1335	-22.154
2491	541	COMB74	-0.0081	-0.1044	-0.0556	0.0174	-0.1298	-24.555
2491	2067	COMB75	-0.0128	-0.0842	-0.0992	0.0569	-0.154	-35.114
2491	2102	COMB75	-0.006	-0.0926	-0.0961	0.0561	-0.1547	-32.874
2491	2103	COMB75	-0.0057	-0.128	-0.1002	0.0506	-0.1843	-29.312
2491	541	COMB75	-0.0118	-0.1196	-0.1034	0.0509	-0.1823	-31.235
2491	2067	COMB76	-0.0117	-0.0938	-0.1579	0.1104	-0.2159	-37.72
2491	2102	COMB76	-0.0072	-0.1054	-0.1538	0.1052	-0.2178	-36.145

2491	2103	COMB76	-0.0053	-0.141	-0.1589	0.0996	-0.2459	-33.437
2491	541	COMB76	-0.0079	-0.1304	-0.163	0.1049	-0.2433	-34.7
2491	2067	COMB77	0.0165	-0.0437	-0.1784	0.1673	-0.1945	-40.207
2491	2102	COMB77	0.0016	-0.0603	-0.1713	0.1448	-0.2035	-39.876
2491	2103	COMB77	0.0052	-0.1227	-0.1762	0.1287	-0.2462	-35.029
2491	541	COMB77	0.0219	-0.1102	-0.1832	0.1506	-0.2389	-35.094
2491	2067	COMB78	0.1314	0.0725	0.156	0.2607	-0.0569	39.656
2491	2102	COMB78	0.061	0.0917	0.1568	0.2339	-0.0812	47.798
2491	2103	COMB78	0.0391	-0.1182	0.1679	0.1459	-0.2249	32.445
2491	541	COMB78	0.0746	-0.1295	0.1671	0.1683	-0.2233	29.297
2491	2067	COMB79	-0.056	-0.1411	-0.2409	0.146	-0.3432	-39.992
2491	2102	COMB79	-0.024	-0.1498	-0.2373	0.1586	-0.3324	-37.574
2491	2103	COMB79	-0.0205	-0.1658	-0.2434	0.1609	-0.3471	-36.69
2491	541	COMB79	-0.0485	-0.1581	-0.247	0.1497	-0.3563	-38.744
2491	2067	COMB80	-0.0687	-0.2173	-0.4089	0.2726	-0.5586	-39.85
2491	2102	COMB80	-0.0321	-0.2315	-0.4037	0.284	-0.5476	-38.065
2491	2103	COMB80	-0.0245	-0.2372	-0.4119	0.2945	-0.5562	-37.759
2491	541	COMB80	-0.0534	-0.2262	-0.4171	0.2862	-0.5657	-39.149
2491	2067	COMB81	-0.033	-0.2293	-0.5802	0.4573	-0.7196	-40.2
2491	2102	COMB81	-0.0246	-0.2577	-0.5706	0.4412	-0.7235	-39.23
2491	2103	COMB81	-0.0118	-0.2812	-0.5814	0.4503	-0.7433	-38.476
2491	541	COMB81	-0.0093	-0.2604	-0.591	0.4694	-0.7391	-39.003
2491	2067	COMB82	0.1551	0.0879	-0.4547	0.5774	-0.3344	-42.884
2491	2102	COMB82	0.0415	0.0421	-0.4315	0.4733	-0.3897	-45.02
2491	2103	COMB82	0.0572	-0.1457	-0.4367	0.404	-0.4926	-38.462
2491	541	COMB82	0.1747	-0.121	-0.4599	0.5099	-0.4562	-36.088
2491	2067	COMB83	0.5247	0.5431	1.7453	2.2793	-1.2114	45.151
2491	2102	COMB83	0.3032	0.6712	1.7155	2.2126	-1.2382	48.061
2491	2103	COMB83	0.1391	-0.2169	1.7656	1.7356	-1.8135	42.122
2491	541	COMB83	0.2026	-0.2652	1.7953	1.7792	-1.8418	41.289
2491	2067	COMB84	-0.0558	-0.1378	-0.2293	0.1362	-0.3298	-39.93
2491	2102	COMB84	-0.0237	-0.1461	-0.2257	0.149	-0.3188	-37.415
2491	2103	COMB84	-0.0204	-0.164	-0.2317	0.1503	-0.3348	-36.387
2491	541	COMB84	-0.0487	-0.1568	-0.2353	0.1386	-0.3441	-38.534
2491	2067	COMB85	-0.0659	-0.214	-0.3878	0.2549	-0.5348	-39.596
2491	2102	COMB85	-0.0307	-0.2274	-0.3826	0.2659	-0.5241	-37.789
2491	2103	COMB85	-0.0234	-0.2369	-0.3904	0.2746	-0.5349	-37.355
2491	541	COMB85	-0.0515	-0.2264	-0.3957	0.2663	-0.5442	-38.767
2491	2067	COMB86	-0.0237	-0.2239	-0.5408	0.4261	-0.6738	-39.757
2491	2102	COMB86	-0.0205	-0.2515	-0.5312	0.4076	-0.6796	-38.866
2491	2103	COMB86	-0.0085	-0.2818	-0.5413	0.4131	-0.7033	-37.915
2491	541	COMB86	-0.0017	-0.2615	-0.5509	0.4344	-0.6976	-38.367
2491	2067	COMB87	0.177	0.1026	-0.3806	0.5222	-0.2426	-42.208

2491	2102	COMB87	0.0508	0.0577	-0.3575	0.4118	-0.3032	-45.275
2491	2103	COMB87	0.0649	-0.1419	-0.3614	0.3374	-0.4144	-37.018
2491	541	COMB87	0.1933	-0.1176	-0.3845	0.4526	-0.3769	-33.995
2491	2067	COMB88	0.5663	0.5848	1.8825	2.458	-1.307	45.141
2491	2102	COMB88	0.3206	0.7137	1.8524	2.38	-1.3456	48.028
2491	2103	COMB88	0.1534	-0.1942	1.9046	1.8921	-1.9328	42.393
2491	541	COMB88	0.2379	-0.2424	1.9346	1.9472	-1.9517	41.462
2491	2067	COMB89	0.0087	-0.0413	0.0152	0.0129	-0.0456	15.64
2491	2102	COMB89	0.0039	-0.0476	0.0178	0.0095	-0.0531	17.316
2491	2103	COMB89	0.0016	-0.0962	0.0152	0.0039	-0.0985	8.643
2491	541	COMB89	0.0045	-0.089	0.0126	0.0062	-0.0906	7.555
2491	2067	COMB90	0.009	-0.0407	0.0152	0.0133	-0.045	15.785
2491	2102	COMB90	0.004	-0.047	0.0178	0.0096	-0.0526	17.488
2491	2103	COMB90	0.0017	-0.0956	0.0153	0.0041	-0.0979	8.712
2491	541	COMB90	0.0048	-0.0883	0.0127	0.0065	-0.09	7.616
2491	2067	COMB91	0.0091	-0.0395	0.0154	0.0135	-0.0439	16.174
2491	2102	COMB91	0.004	-0.0458	0.0179	0.0098	-0.0516	17.874
2491	2103	COMB91	0.0017	-0.0944	0.0154	0.0041	-0.0968	8.861
2491	541	COMB91	0.0049	-0.0871	0.0128	0.0067	-0.0888	7.764
2491	2067	COMB92	0.0086	-0.0372	0.0156	0.0134	-0.042	17.116
2491	2102	COMB92	0.0038	-0.0436	0.0182	0.01	-0.0498	18.71
2491	2103	COMB92	0.0015	-0.0921	0.0155	0.004	-0.0947	9.173
2491	541	COMB92	0.0044	-0.0848	0.013	0.0063	-0.0866	8.101
2491	2067	COMB93	0.0069	-0.0339	0.0159	0.0123	-0.0393	18.997
2491	2102	COMB93	0.0032	-0.0402	0.0185	0.01	-0.047	20.209
2491	2103	COMB93	0.0008748	-0.0887	0.0158	0.0036	-0.0914	9.713
2491	541	COMB93	0.0027	-0.0814	0.0132	0.0047	-0.0834	8.733
2491	2067	COMB94	-0.0044	-0.1442	0.0368	0.0047	-0.1533	13.883
2491	2102	COMB94	-0.0035	-0.157	0.0429	0.0077	-0.1681	14.596
2491	2103	COMB94	-0.0088	-0.2706	0.0366	-0.0038	-0.2756	7.821
2491	541	COMB94	-0.014	-0.2556	0.0306	-0.0102	-0.2594	7.101
2491	2067	COMB95	0.0001788	-0.0303	0.0162	0.0072	-0.0374	23.396
2491	2102	COMB95	0.0008059	-0.036	0.0188	0.0087	-0.0439	22.838
2491	2103	COMB95	-0.0015	-0.0845	0.0161	0.0015	-0.0875	10.585
2491	541	COMB95	-0.004	-0.0779	0.0135	-0.0016	-0.0803	10.026
2491	2067	COMB96	-0.0043	-0.0338	0.0159	0.0026	-0.0407	23.572
2491	2102	COMB96	-0.0007561	-0.0387	0.0185	0.0068	-0.0463	22.134
2491	2103	COMB96	-0.003	-0.0875	0.0158	-0.000177	-0.0903	10.264
2491	541	COMB96	-0.0084	-0.0816	0.0132	-0.0061	-0.0839	9.911
2491	2067	COMB97	-0.0124	-0.1584	0.0351	-0.0044	-0.1663	12.832
2491	2102	COMB97	-0.0062	-0.1695	0.0413	0.0036	-0.1794	13.409
2491	2103	COMB97	-0.0114	-0.2838	0.0353	-0.0069	-0.2883	7.268
2491	541	COMB97	-0.0218	-0.2705	0.0291	-0.0184	-0.2739	6.585

2491	2067	COMB98	0.0134	-0.0699	0.009	0.0143	-0.0709	6.095
2491	2102	COMB98	0.0059	-0.0749	0.0122	0.0077	-0.0767	8.372
2491	2103	COMB98	0.0042	-0.126	0.0105	0.005	-0.1268	4.574
2491	541	COMB98	0.0104	-0.1204	0.0073	0.0108	-0.1208	3.192
2491	2067	COMB99	0.0616	-0.0959	-0.0137	0.0628	-0.0971	-4.943
2491	2102	COMB99	0.0238	-0.103	-0.0073	0.0242	-0.1034	-3.269
2491	2103	COMB99	0.0252	-0.1721	-0.0064	0.0254	-0.1723	-1.866
2491	541	COMB99	0.064	-0.1677	-0.0129	0.0647	-0.1684	-3.176
2491	2067	COMB100	0.076	-0.2069	0.0008611	0.076	-0.2069	0.174
2491	2102	COMB100	0.0341	-0.2005	0.0049	0.0342	-0.2006	1.196
2491	2103	COMB100	0.0181	-0.4093	0.0088	0.0183	-0.4094	1.181
2491	541	COMB100	0.0295	-0.4104	0.0048	0.0296	-0.4104	0.622
2491	2067	COMB101	-0.052	-0.0393	0.0152	-0.0292	-0.0621	56.347
2491	2102	COMB101	-0.0175	-0.038	0.0181	-0.007	-0.0486	30.209
2491	2103	COMB101	-0.0196	-0.0881	0.0154	-0.0163	-0.0914	12.097
2491	541	COMB101	-0.0556	-0.0886	0.0125	-0.0514	-0.0928	18.617
2491	2067	COMB102	-0.0329	-0.1334	0.0041	-0.0328	-0.1336	2.359
2491	2102	COMB102	-0.0099	-0.1304	0.0076	-0.0095	-0.1309	3.597
2491	2103	COMB102	-0.0114	-0.1831	0.0068	-0.0111	-0.1834	2.252
2491	541	COMB102	-0.0354	-0.1856	0.0033	-0.0353	-0.1857	1.261
2491	2067	COMB103	0.0782	-0.2708	-0.0256	0.0801	-0.2727	-4.177
2491	2102	COMB103	0.0311	-0.273	-0.0197	0.0323	-0.2743	-3.695
2491	2103	COMB103	0.0322	-0.3364	-0.0162	0.0329	-0.3371	-2.518
2491	541	COMB103	0.0806	-0.3357	-0.0221	0.0818	-0.3369	-3.036
2491	2067	COMB104	0.3395	-0.402	-0.1411	0.3654	-0.428	-10.419
2491	2102	COMB104	0.1273	-0.4176	-0.1179	0.1518	-0.442	-11.703
2491	2103	COMB104	0.1443	-0.5816	-0.1019	0.1583	-0.5957	-7.84
2491	541	COMB104	0.3676	-0.585	-0.1251	0.3838	-0.6012	-7.356
2491	2067	COMB105	0.1177	-1.0357	0.2423	0.1665	-1.0846	11.396
2491	2102	COMB105	0.0913	-1.0187	0.2228	0.1343	-1.0617	10.936
2491	2103	COMB105	-0.0451	-1.8384	0.2118	-0.0204	-1.8631	6.644
2491	541	COMB105	-0.1567	-1.787	0.2313	-0.1245	-1.8192	7.921
2491	2067	COMB106	-0.0546	-0.0447	0.0146	-0.0342	-0.0651	54.3
2491	2102	COMB106	-0.0184	-0.0429	0.0176	-0.0092	-0.0521	27.524
2491	2103	COMB106	-0.0204	-0.0932	0.015	-0.0174	-0.0962	11.179
2491	541	COMB106	-0.0581	-0.0942	0.0121	-0.0545	-0.0979	16.874
2491	2067	COMB107	-0.033	-0.1486	0.0027	-0.033	-0.1487	1.317
2491	2102	COMB107	-0.0098	-0.145	0.0062	-0.0095	-0.1453	2.617
2491	2103	COMB107	-0.0112	-0.1981	0.0056	-0.011	-0.1983	1.715
2491	541	COMB107	-0.0354	-0.2013	0.0021	-0.0353	-0.2013	0.715
2491	2067	COMB108	0.0861	-0.3001	-0.0285	0.0882	-0.3021	-4.194
2491	2102	COMB108	0.0342	-0.302	-0.0224	0.0357	-0.3035	-3.803
2491	2103	COMB108	0.0354	-0.3661	-0.0185	0.0362	-0.3669	-2.629

2491	541	COMB108	0.0887	-0.3655	-0.0245	0.09	-0.3669	-3.078
2491	2067	COMB109	0.3632	-0.444	-0.1452	0.3885	-0.4693	-9.891
2491	2102	COMB109	0.1362	-0.4609	-0.1219	0.1601	-0.4849	-11.106
2491	2103	COMB109	0.1532	-0.6255	-0.1051	0.1672	-0.6394	-7.555
2491	541	COMB109	0.3915	-0.6276	-0.1284	0.4075	-0.6435	-7.071
2491	2067	COMB110	0.1639	-1.0746	0.2386	0.2083	-1.119	10.536
2491	2102	COMB110	0.108	-1.0618	0.219	0.1477	-1.1015	10.266
2491	2103	COMB110	-0.0284	-1.8814	0.2087	-0.0052	-1.9046	6.348
2491	541	COMB110	-0.1105	-1.8257	0.2283	-0.0807	-1.8555	7.454
2491	2067	COMB111	0.0084	-0.0414	0.0143	0.0122	-0.0452	14.895
2491	2102	COMB111	0.0038	-0.0477	0.0169	0.0088	-0.0527	16.608
2491	2103	COMB111	0.0015	-0.0962	0.0143	0.0036	-0.0982	8.151
2491	541	COMB111	0.0043	-0.0889	0.0117	0.0058	-0.0904	7.038
2491	2067	COMB112	0.0085	-0.0414	0.0137	0.012	-0.0449	14.402
2491	2102	COMB112	0.0038	-0.0477	0.0163	0.0086	-0.0524	16.165
2491	2103	COMB112	0.0016	-0.0961	0.0137	0.0034	-0.098	7.85
2491	541	COMB112	0.0044	-0.0888	0.0111	0.0057	-0.0901	6.714
2491	2067	COMB113	0.0084	-0.0414	0.0126	0.0114	-0.0444	13.46
2491	2102	COMB113	0.0038	-0.0477	0.0152	0.0079	-0.0519	15.298
2491	2103	COMB113	0.0015	-0.0959	0.0126	0.0031	-0.0975	7.26
2491	541	COMB113	0.0044	-0.0886	0.01	0.0054	-0.0896	6.086
2491	2067	COMB114	0.0079	-0.0414	0.0105	0.01	-0.0435	11.545
2491	2102	COMB114	0.0035	-0.0478	0.0131	0.0067	-0.0509	13.508
2491	2103	COMB114	0.0013	-0.0956	0.0104	0.0024	-0.0967	6.072
2491	541	COMB114	0.0039	-0.0882	0.0078	0.0046	-0.0889	4.829
2491	2067	COMB115	0.0064	-0.0417	0.0064	0.0073	-0.0426	7.389
2491	2102	COMB115	0.0029	-0.0482	0.0089	0.0045	-0.0497	9.641
2491	2103	COMB115	0.0008111	-0.0953	0.0062	0.0012	-0.0957	3.681
2491	541	COMB115	0.0027	-0.0879	0.0036	0.0028	-0.0881	2.285
2491	2067	COMB116	0.0037	-0.0472	-0.0057	0.0043	-0.0478	-6.351
2491	2102	COMB116	0.0017	-0.0537	-0.0031	0.0019	-0.0539	-3.215
2491	2103	COMB116	-0.0001184	-0.099	-0.006	0.0002449	-0.0994	-3.463
2491	541	COMB116	0.0004586	-0.0916	-0.0086	0.0013	-0.0924	-5.297
2491	2067	COMB117	-0.0007483	-0.0529	-0.0225	0.0076	-0.0613	-20.404
2491	2102	COMB117	-0.0001569	-0.0596	-0.0199	0.0059	-0.0657	-16.877
2491	2103	COMB117	-0.0016	-0.1026	-0.023	0.0034	-0.1076	-12.249
2491	541	COMB117	-0.0032	-0.0951	-0.0256	0.0035	-0.1018	-14.579
2491	2067	COMB118	-0.007	-0.0654	-0.0521	0.0236	-0.0959	-30.349
2491	2102	COMB118	-0.0029	-0.0726	-0.0493	0.0226	-0.0981	-27.39
2491	2103	COMB118	-0.0037	-0.112	-0.0528	0.0178	-0.1335	-22.154
2491	541	COMB118	-0.0081	-0.1044	-0.0556	0.0174	-0.1298	-24.555
2491	2067	COMB119	-0.0128	-0.0842	-0.0992	0.0569	-0.154	-35.114
2491	2102	COMB119	-0.006	-0.0926	-0.0961	0.0561	-0.1547	-32.874

2491	2103	COMB119	-0.0057	-0.128	-0.1002	0.0506	-0.1843	-29.312
2491	541	COMB119	-0.0118	-0.1196	-0.1034	0.0509	-0.1823	-31.235
2491	2067	COMB120	-0.0117	-0.0938	-0.1579	0.1104	-0.2159	-37.72
2491	2102	COMB120	-0.0072	-0.1054	-0.1538	0.1052	-0.2178	-36.145
2491	2103	COMB120	-0.0053	-0.141	-0.1589	0.0996	-0.2459	-33.437
2491	541	COMB120	-0.0079	-0.1304	-0.163	0.1049	-0.2433	-34.7
2491	2067	COMB121	0.0165	-0.0437	-0.1784	0.1673	-0.1945	-40.207
2491	2102	COMB121	0.0016	-0.0603	-0.1713	0.1448	-0.2035	-39.876
2491	2103	COMB121	0.0052	-0.1227	-0.1762	0.1287	-0.2462	-35.029
2491	541	COMB121	0.0219	-0.1102	-0.1832	0.1506	-0.2389	-35.094
2491	2067	COMB122	0.1314	0.0725	0.156	0.2607	-0.0569	39.656
2491	2102	COMB122	0.061	0.0917	0.1568	0.2339	-0.0812	47.798
2491	2103	COMB122	0.0391	-0.1182	0.1679	0.1459	-0.2249	32.445
2491	541	COMB122	0.0746	-0.1295	0.1671	0.1683	-0.2233	29.297
2491	2067	COMB123	-0.056	-0.1411	-0.2409	0.146	-0.3432	-39.992
2491	2102	COMB123	-0.024	-0.1498	-0.2373	0.1586	-0.3324	-37.574
2491	2103	COMB123	-0.0205	-0.1658	-0.2434	0.1609	-0.3471	-36.69
2491	541	COMB123	-0.0485	-0.1581	-0.247	0.1497	-0.3563	-38.744
2491	2067	COMB124	-0.0687	-0.2173	-0.4089	0.2726	-0.5586	-39.85