MyLA311_Service_request

Let's visualize the MyLA311 Service Request data to see what insights we can get from it.

```
#import the myLA311 Service Request Dataset as SRD

SRD = read.csv("MyLA311_Service_Request_Data_2018.csv")

# copy SRD to data1 so that we can process on a copy
data1<-SRD
```

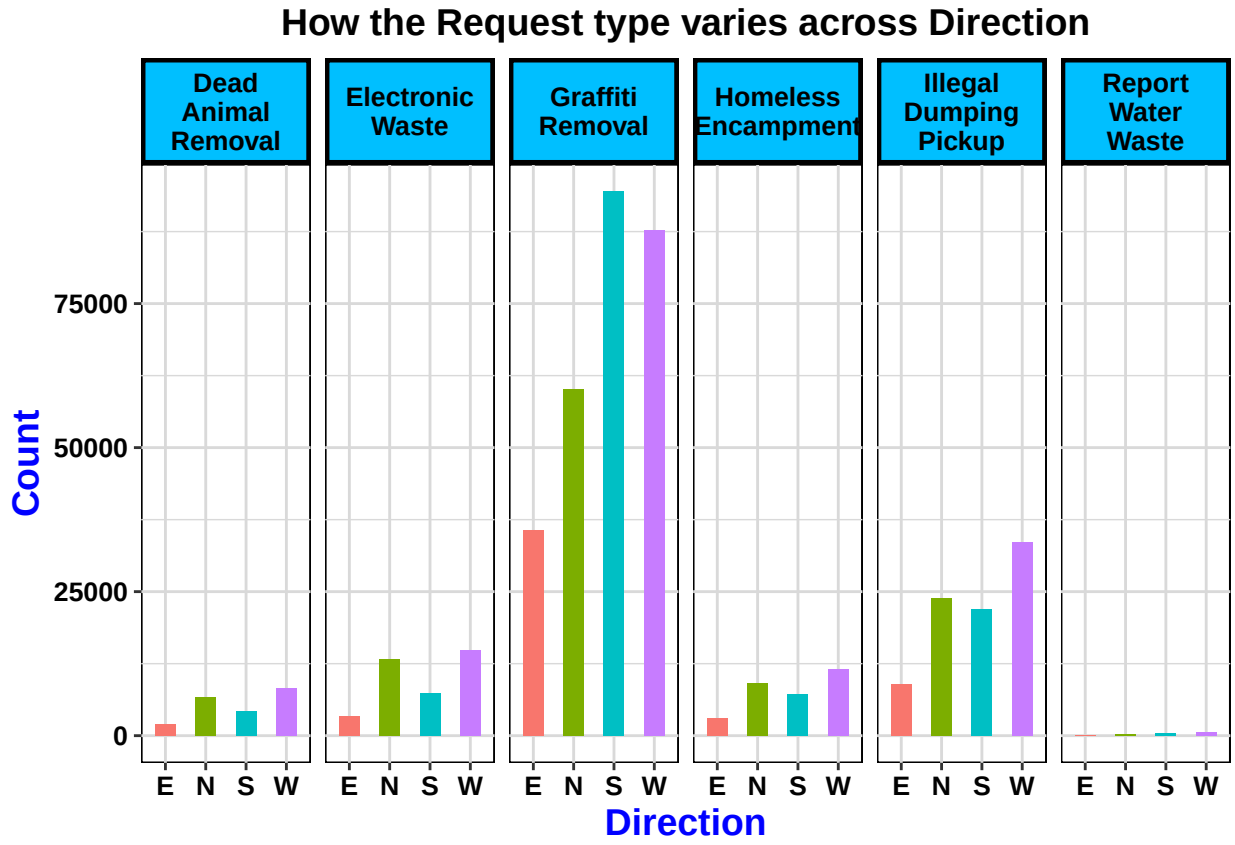
1

group by direction and request type and get the count

```
data1<-group_by(SRD,SRD$Direction,SRD$RequestType)%>%summarise(count=n())

colnames(data1)<-c("Direction","RequestType","count")
#remove NA's
data1<-data1[!is.na(data1$Direction),]

data1<-data1%>%
  filter(Direction=="N"|Direction=="W"|Direction=="E"|Direction=="S")

data1$RequestType <- replace(data1$RequestType,
                             data1$RequestType == "Metal/Household Appliances",
                             "Household Appliances")

data1<-data1%>%
  filter(RequestType!="Bulky Items"&RequestType!="Feedback"&
           RequestType!="Other"&RequestType!="Single Streetlight Issue"&
           RequestType!="Multiple Streetlight Issue")
```

We plot the bar plot to get insights on how the Request Type varies across each Direction. Where N,S,E,W represents North,South,East and West Respectively and how the count of each type of request varies

```
ggplot(data1,aes(x=reorder(Direction,count),y=count,fill=Direction))+
  geom_bar(stat="identity",width=0.5)+
  facet_grid(.~RequestType,scales="free", labeller = label_wrap_gen(width=1))+
  ggtitle("How the Request type varies across Direction")+
  xlab("Direction")+
  ylab("Count")+
  theme(
    plot.title = element_text(color="black", size=14, face="bold",hjust=0.5),
    axis.title.x = element_text(color="blue1", size=14, face="bold"),
    axis.title.y = element_text(color="blue1", size=14, face="bold"),
    panel.grid.major = element_line(size = 0.5, linetype = 'solid',
                                    colour = "gray85"),
    panel.grid.minor = element_line(size = 0.25, linetype = 'solid',
                                    colour = "gray85"),
    panel.background = element_rect(fill = "white",
                                    colour = "black",
                                    size = 0.5, linetype = "solid"),
    legend.position = "none",
    axis.text.y = element_text(face = "bold", color = "black", size = 10),
    axis.text.x = element_text(face = "bold", color = "black", size = 10),
    strip.text.x = element_text(size = 10, color = "Black", face = "bold"),
    strip.background = element_rect(
      color="black", fill="deepskyblue1", size=1.5, linetype="solid"))
```



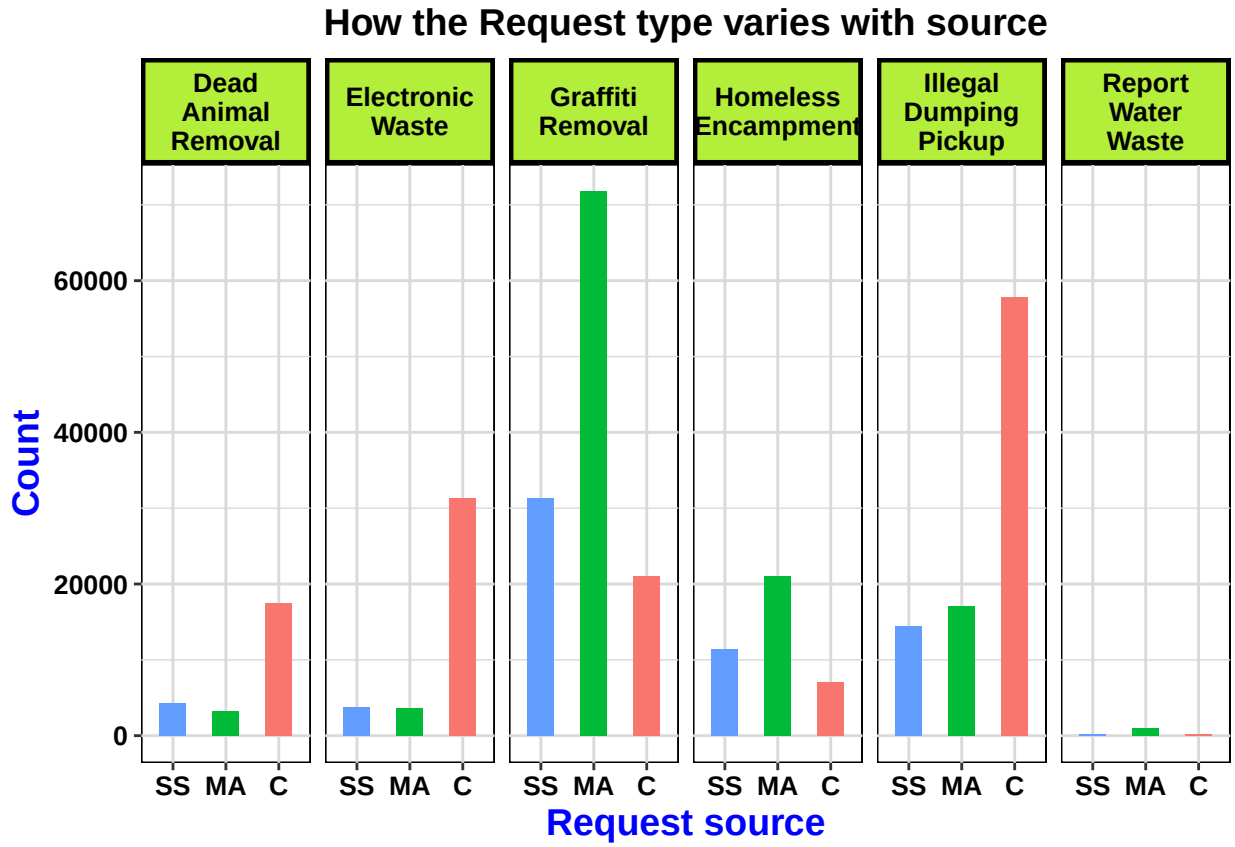
Overall we see that the number of Requests is significantly more in the West and the number of requests is significantly less in the East

2

We plot the bar plot to gain insights on how the request type varies with the request source and how the count varies with the request type

```
data1<-SRD

#group by direction and request type and get the count
data1<-group_by(SRD,SRD$RequestSource,SRD$RequestType)%>%summarise(count=n())

colnames(data1)<-c("Requestsource","RequestType","count")

data1<-data1%>%
  filter(Requestsource=="Self Service"|Requestsource=="Call"|Requestsource=="Mobile App")
```

```r
data1$RequestType <- replace(data1$RequestType,
                             data1$RequestType == "Metal/Household Appliances",
                             "Household Appliances")

data1<-data1%>%
  filter(RequestType!="Bulky Items"&RequestType!="Feedback"&
           RequestType!="Other"&RequestType!="Single Streetlight Issue"&
           RequestType!="Multiple Streetlight Issue")

#plot the bar plot
ggplot(data1,aes(x=reorder(Requestsource,count),y=count,fill=Requestsource))+
  geom_bar(stat="identity",width=0.5)+
  facet_grid(.~RequestType,scales="free", labeller = label_wrap_gen(width=1))+
  ggtitle("How the Request type varies with source")+
  xlab("Request source")+
  scale_x_discrete(labels=c("SS","MA","C"))+
  ylab("Count")+
  theme(
    plot.title = element_text(color="black", size=14, face="bold",hjust=0.5),
    axis.title.x = element_text(color="blue1", size=14, face="bold"),
    axis.title.y = element_text(color="blue1", size=14, face="bold"),
    panel.grid.major = element_line(size = 0.5, linetype = 'solid',
                                    colour = "gray85"),
    panel.grid.minor = element_line(size = 0.25, linetype = 'solid',
                                    colour = "gray85"),
    panel.background = element_rect(fill = "white",
                                    colour = "black",
                                    size = 0.5, linetype = "solid"),
    legend.position = "none",
    axis.text.y = element_text(face = "bold", color = "black", size = 10),
    axis.text.x = element_text(face = "bold", color = "black", size = 10),
    strip.text.x = element_text(size = 10, color = "Black", face = "bold"),
    strip.background = element_rect(
      color="black", fill="olivedrab2", size=1.5, linetype="solid"))
```



We can see that the requests placed over Mobile Applications are significantly more the other. So we can say that more number of people perfer to use Mobile Application. Thus we can work on improving the app and using it for Advertisement / Alert purposes.The next largest number of request was placed over call. We can conclude that we might need to work on / appoint more people who handle the incoming service calls

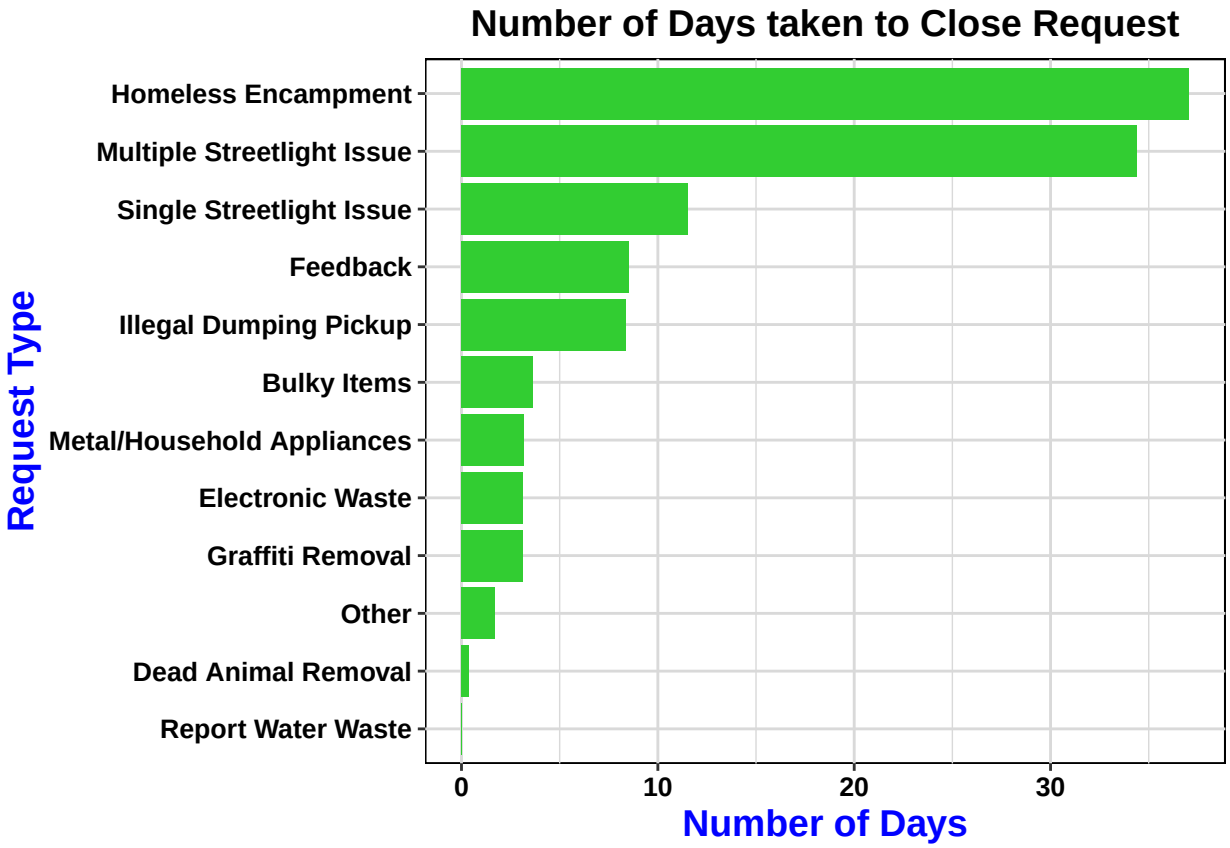
3

We plot a bar plot to get insights on the Number of days taken to close the request for each request type

```
#Assign the entire dataset to data1

data1<-SRD
#get start and end date
start<-mdy_hms(data1$CreatedDate)
```

```
end<-mdy_hms(data1$ClosedDate)
# get the interval between them
interval_1=interval(start,end)
#get duration
duration_1<-as.duration(interval_1)
#split the duration for cleaning
dur_split1<-str_split(duration_1,"~")
#get the first split values
first_split<-sapply(dur_split1, head, 1)
#split again for cleaning
dur_split2<-str_split(first_split,"s")
#get the first value
first_split2<-sapply(dur_split2,head,1)

#convert to numeric
first_split2<-as.numeric(first_split2)

# to get time interval in days
timeinterval<-first_split2/86400

#round the decimal to 2 places
timeinterval<-round(timeinterval,2)

# mutate the days to the dataset
data1<-data1%>%
  mutate(timeduration=timeinterval)

#remove NA's

data1<-data1[!is.na(data1$RequestType),]
data1<-data1[!is.na(data1$timeduration),]

data2<-aggregate(data1[,34], list(data1$RequestType), mean)

colnames(data2)<-c("ReqestType","Count")

ggplot(data2,aes(x=reorder(data2$ReqestType,data2$Count),y=data2$Count))+
  geom_bar(stat="identity",fill="limegreen")+
  coord_flip()+
  ggtitle("Number of Days taken to Close Request")+
  xlab("Request Type")+
  ylab("Number of Days")+
  theme(
    plot.title = element_text(color="black", size=14, face="bold",hjust=0.5),
    axis.title.x = element_text(color="blue1", size=14, face="bold"),
    axis.title.y = element_text(color="blue1", size=14, face="bold"),
    panel.grid.major = element_line(size = 0.5, linetype = 'solid',
                                    colour = "gray85"),
    panel.grid.minor = element_line(size = 0.25, linetype = 'solid',
                                    colour = "gray85"),
    panel.background = element_rect(fill = "white",
                                    colour = "black",
                                    size = 0.5, linetype = "solid"),
```

```
    legend.position = "none",
    axis.text.y = element_text(face = "bold", color = "black", size = 10),
    axis.text.x = element_text(face = "bold", color = "black", size = 10),
    strip.text.x = element_text(size = 10, color = "Black", face = "bold"),
    strip.background = element_rect(
      color="black", fill="olivedrab2", size=1.5, linetype="solid"))
```

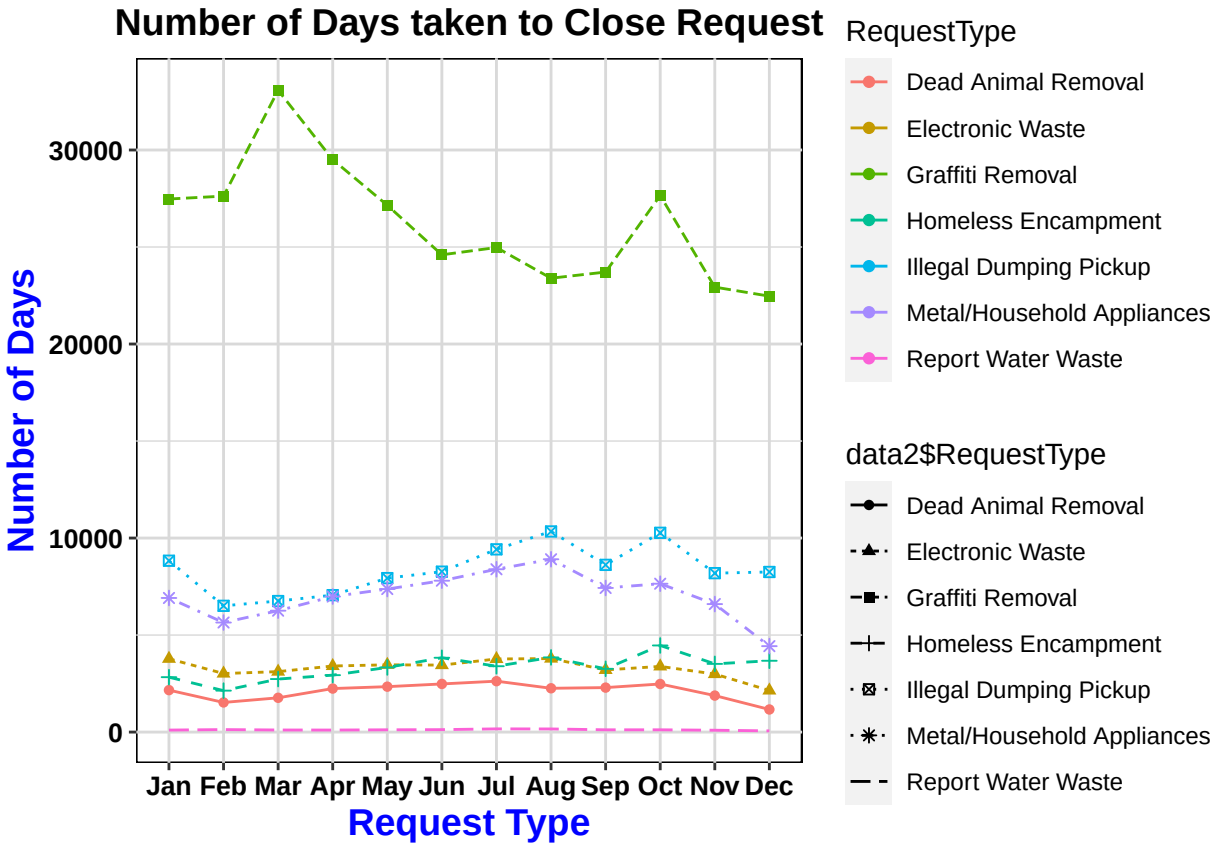


We see the number of days taken to chose the request. We now get an idea as to which request needs to be closed sooner. We see that Homeless Encampment and Street light issues take the most amount of time. It would be best to alert the respective authorities of the data and findings to ensure that the issue is solved sooner.

4

We plot a line plot of the number of days taken to close a request across each request type

```
data1<-SRD

month_col<-mdy_hms(data1$CreatedDate)
data1<-data1%>%
  mutate(month=month(month_col,label=TRUE))

data2<-data1%>%group_by(RequestType,month)%>%tally()

data2<-data2%>%
  filter(RequestType!="Bulky Items"&RequestType!="Feedback"&
           RequestType!="Other"&RequestType!="Single Streetlight Issue"&
           RequestType!="Multiple Streetlight Issue")


ggplot(data2, aes(x=data2$month, y=data2$n,
                  group=data2$RequestType,color=RequestType)) +
  geom_line(aes(linetype=data2$RequestType))+
  geom_point(aes(shape=data2$RequestType))+
  ggtitle("Number of Days taken to Close Request")+
  xlab("Request Type")+
  ylab("Number of Days")+
  theme(
    plot.title = element_text(color="black", size=14, face="bold",hjust=0.5),
    axis.title.x = element_text(color="blue1", size=14, face="bold"),
    axis.title.y = element_text(color="blue1", size=14, face="bold"),
    panel.grid.major = element_line(size = 0.5, linetype = 'solid',
                                    colour = "gray85"),
    panel.grid.minor = element_line(size = 0.25, linetype = 'solid',
                                    colour = "gray85"),
    panel.background = element_rect(fill = "white",
                                    colour = "black",
                                    size = 0.5, linetype = "solid"),

    axis.text.y = element_text(face = "bold", color = "black", size = 10),
    axis.text.x = element_text(face = "bold", color = "black", size = 10),
    strip.text.x = element_text(size = 10, color = "Black", face = "bold"),
    strip.background = element_rect(
      color="black", fill="olivedrab2", size=1.5, linetype="solid"))
```



Thus we have visualized the data using various plots and derived usefull insights.